ENABLING PROJECTS OF REGIONAL SIGNIFICANCE

Designing a framework to categorise, measure and deliver projects of significance to the Sunshine Coast region

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SUMMARY

Abstract

The financial feasibility of a single project for a sponsor or developer can be measured with static analysis, in the form of profit projections with forecast returns calculated as a margin, payback period or benefit-to-costs ratio. For larger scale projects developers employ a more dynamic modelling process in which the time value of money is explicitly considered. The most popular form of dynamic analysis relates to cash flow projections and measurements of internal rates of return and net present value.

Similar measures are adopted by state and local authorities when evaluating the potential benefits of pursuing significant, 'game-changing' projects. For example, when considering the environmental impact of the Sunshine Coast Airport expansion, the economic assessment evaluated two separate sets of potential project benefits. The first, net economic benefit, utilises benefit–cost analysis techniques to estimate whether the benefits of the expansion outweigh the costs from the Queensland Government's perspective. The second, regional economic benefit, uses input/output modelling techniques to estimate the contribution of the project to gross regional product and regional employment (Sunshine Coast Regional Council [SCRC] 2014b).

Sharing methods and approaches to assess the impact of projects across key stakeholders creates a shared, or collective, understanding. The collective understanding of baseline modelling and sensitivities may assist one stakeholder better understand the preferences or thresholds of another. Greater understanding leads to more efficient use of resources by accelerating the negotiation processes and, if the motivation exists, enable effective, collective decision-making.

However, there is no shared definition for what constitutes a game-changing or priority regional project. The measures employed by the sponsors and respective authorities are project-centric and have two clear limitations. When used in an environmental impact statement, the measures are generally applied at a single point in time, looking at an isolated project rather than that project's influence on the portfolio of regional projects, both underway and proposed. The second limitation is evident in the Sunshine Coast Airport expansion analysis, in which there is no explicit consideration of how the project, or portfolio of projects, impacts existing property values. In addition to assisting private industry players, the projection of property value changes is essential in modelling how the state government recaptures project expenses through land tax.

Through improved measurement and optimised portfolio grouping, stakeholders may be better informed and equipped to make decisions in the interests of the project, portfolio and regional economy.

Background

The Sunshine Coast economy has undergone a period of noticeable growth and change since the Regional Economic Development Strategy was implemented in 2013 (SCRC 2018c). According to the SCRC (2018c), gross regional product has increased $3.8 billion, or 5.7% per annum, through to 2017. The Council's implementation report card estimates the economic uplift, but does not inform whether that estimate is a sufficient return on investment. Sunshine Coast business groups such as the Sunshine Coast Business Council (SCBC 2018) have taken the enquiry further with their program to understand how projects may be managed to realise a promised ripple effect.

This research is an extension of the SCBC's (2017) work. It deepens the discussion by considering the relationship between projects and the economy. Limitations and opportunities for improving financial and economic analysis are covered in the review of literature and research.

Research approach

The goal of this research is to design an evaluation framework to better assess the financial and economic benefits of proposed game-changing projects on the Sunshine Coast. The evaluation framework is designed to define and categorise projects and portfolios of regional significance. It suggests approaches to measure financial and economic impacts, and extends to considering how regional economic benefits are optimised by employing alternative project management approaches and portfolio management practices.

The research utilises a design science framework to diagnosis the problem, build a theory, design an artefact and evaluate the artefact (Hevner et al. 2004; Peffers et al. 2008; Venable 2017).

Review of literature and research

This review has been completed in an iterative manner, with knowledge extended by considering past research findings. Where empirical evidence narrows, published guidelines and frameworks are reviewed to inform the design of the project evaluation framework. A summary of review findings are presented in Table I.

Table I: Summary of the review of literature and research

PROJECTS AND CLASSIFICATION	- There is evidence of confusion regarding what is a project and what is an operation. - There is an absence of any generally agreed system for the classification or categorisation of projects. - Frameworks and criteria prescribed by the Australian and Queensland governments assist with measuring project scale, but the thresholds and terminology are not universally adopted. - Some clear threads have emerged to inform project categorisation with impact considered in three main categories: intent, investment and employment.
PROJECT SELECTION, MEASUREMENT AND FRAMING	- Discounted cash flow analysis is the pre-eminent tool for measuring return on investment. - Economic analysis builds on the financial analysis, with other impacts and benefits modelled. Given the broad scope, there is some conjecture as to whether the errors in economic impact modelling stem from misunderstanding or deliberate misrepresentation. - Frameworks and guidelines for infrastructure and transport projects in Australia are provided by the Australian Transport Assessment and Planning and Infrastructure Australia. Public projects in Queensland are supported by Treasury's Project Assessment Framework and advisor, Building Queensland.
VALUE CAPTURE	Value capture presents an approach to fund infrastructure projects in Australia.
PROJECT AND PORTFOLIO MANAGEMENT	- Project management refers to the application of knowledge, skills, tools and techniques to project activities to meet the project requirements, focusing on doing a project the right way. - Portfolio managers focus on doing the 'right' programs and projects. Portfolio management is the centralised management of one or more portfolios to achieve strategic objectives. - Facilitating the delivery of a suite of regionally significant projects comes with high-uncertainty. Agile techniques may be well suited.

Framework design

The design and framework are considered two deliverable parts of this research. The report provides the reasoning behind the design of the framework artefact. The second part is the framework artefact, which is presented as a dynamic template. The template is built in Microsoft Excel. The evaluation framework comprises four main sheets relating to the scope of this research. The first primary sheet is the categorisation rubric. This is designed to assist categorising projects in a manner that effectively articulates expectations. The categorisation rubric is presented in Table II.

Two additional sheets provide a template for financial and economic analysis, demonstrating the functionality promoted in the framework design. The financial and economic analysis sheets contain monthly discounted cash flow (DCF) models with effective calculations of net present value. There is capacity for the sheets to be linked, providing scope for the economic analysis to build on the investment analysis. Both DCFs support the inclusion of land use impacts.

A final primary sheet is prepared for an initial portfolio analysis. The portfolio analysis mainly focuses on investment spend and timing. It may be linked to the previous financial analysis modelling, or other spreadsheets depicting the quantum and timing of project investment. By modelling the forecast investment as a cashflow, the impact of a single project, or suite of projects, on the portfolio of priority and high priority regional projects may be analysed.

Table II: Regional significance project rubric

PROJECT	CRITERIA	PORTFOLIO [+1]	PROJECT [+1]	PROCESS [−1]	MANAGEMENT [0]	ACTIVITY [0]
	Nature of initiative	Projects, programs, subsidiary portfolios and operations managed as a group to achieve strategic objectives	Temporary endeavour[s] undertaken to create a unique product, service or result	Systematic series of activities directed towards improving a product, service or result	Systematic series of activities directed towards maintaining a product, service or result	A distinct, scheduled portion of work performed during a project
IMPACT	CRITERIA	HIGH PRIORITY [1.00]	PRIORITY (Fairly important) [0.75]	IMPORTANT [0.50]	SLIGHTLY IMPORTANT [0.25]	NOT AT ALL IMPORTANT [0.00]
	Prescribed or adopted **intent** to transform the region's economy [50]	Potential to transform the region's economy and its employment base, generating an array of associated investment opportunities	Potential to materially improve the region's economy and its employment base, generating associated investment opportunities	Potential to improve the region's economy and its employment base, generating associated investment opportunities	Potential to improve the region's economy and/or its employment base	No potential to materially improve the region's economy or its employment base
	Initial capital **investment** [25]	Estimated investment exceeds A$250 million	Estimated investment of A$100 million to A$250 million	Estimated investment of A$50 million to A$100 million	Estimated investment of A$10 million to A$50 million	Estimated investment less than A$10 million
	Sustained new **employment** [25]	Estimated ongoing FTE jobs exceeds 2000	Estimated ongoing FTE jobs of 1000 to 2000	Estimated ongoing FTE jobs of 200 to 1000	Estimated ongoing FTE jobs of 20 to 200	Estimated ongoing FTE jobs less than 20

Evaluating the categorisation rubric

The categorisation rubric has been applied to a selection of regional projects identified as either catalytic or game-changer projects, including the Sunshine Coast light rail project (see Table III).

Table III: Regional priority categorisation rubric output

PROJECT	CATEGORISATION	DISCUSSISON
Health precinct	High priority	The Sunshine Coast health precinct is said to underpin the growth and investment of the Sunshine Coast's health and wellbeing industry.
Airport expansion project	High priority	The Sunshine Coast Airport expansion would be allocated high priority status; although, a reduction in employment could see the project allocated a lower priority categorisation.
Aura master planned community	Priority	Due to the projected initial capital investment and sustained new employment, Aura would be categorised as a priority project.
Maroochydore City Centre / The Bright City	Not available	The Maroochydore city centre has missing information regarding employment numbers. Through a scenario or 'work back' it may be determined that the Maroochydore city centre would need to sustain 1000 or more new ongoing FTE positions to gain high priority status.
International broadband submarine cable	Priority	The international broadband submarine cable would share priority project status due to the intent to transform the region's economy. The status of the submarine cable project would require re-evaluation when the scope is refined.
Light rail	Priority	The light rail project reaches priority status. This may be attributed to the influence the project is proposed to have on land use and planning. The introduction of light rail and supporting integrated transport network are a justification for a more compact and sustainable settlement pattern.
North Coast Connect	Not available	The North Coast Connect rail feasibility study is currently being developed. The rail project would need to sustain 1000 or more new ongoing FTE positions to gain high priority status.

The regional priority categorisation rubric enables categorisation of a suite of regional projects. The exercise was relatively direct and easy to apply; however, there were limitations. The assessment of 'prescribed or adopted intent to transform the region's economy' retains a level of subjectivity, even with narrated criteria. The other categories appear easy to apply, but sourcing consistent project information remains problematic, as there are very few consistent approaches to reporting initial capital investment or sustained new employment.

Findings

This research has addressed an emerging issue, and opportunity, in project management. The study demonstrates the application of a body of knowledge to research, investigates and develops new knowledge, and advances that knowledge in the specific field of regional project decision-making. This cross-disciplinary research presents the artefact and journey for subsequent empirical testing.

The research presents a way to categorise, measure and deliver projects of significance to the Sunshine Coast region and realise the economic benefits or 'ripple effect'.

Glossary

Major project status: 'the Australian Government's formal recognition of the national strategic significance of a project, through its contribution to economic growth, employment, or contribution to regional Australia' (DIIS 2018).

Organisational project management: 'framework in which portfolio, program, and project management are integrated with organisational enablers in order to achieve strategic objectives' (PMI 2017a, p. 17).

Portfolio: 'projects, programs, subsidiary portfolios, and operations managed as a group to achieve strategic objectives' (PMI 2017a, p. 11).

Portfolio management: 'the centralised management of one or more portfolios to achieve strategic objectives. The programs or projects of the portfolio may not be interdependent or directly related' (PMI 2017a, p. 15).

Program: 'group of related projects, subsidiary programs, and program activities managed in a coordinated manner to obtain benefits not available from managing them individually' (PMI 2017a, p. 11).

Project: 'temporary endeavour undertaken to create a unique product, service or result' (PMI 2017a, p. 4).

Regional economic clusters: 'areas that are likely to involve higher-value and "outward looking" industries and jobs, and as such, present enormous opportunities for the SEQ economy' (DILP 2017, p. 50).

Ripple effect: 'a situation in which one event produces effects which spread and produce further effects' (Cambridge University Press 2018).

Stakeholder: 'an individual, group, or organisation that may affect, be affected by, or perceive itself to be affected by a decision, activity, or outcome of a project, program, or portfolio' (PMI 2017a ,p. 723).

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LIST OF ABBREVIATIONS

ATAP   Australian Transport Assessment and Planning

CEA   cost effectiveness analysis

CGE   computable general equilibrium

CUM   capacity utilisation model

DCF   discounted cash flow

DIIS   Department of Industry, Innovation and Science

DIRD   Department of Infrastructure and Regional Development

DSDMIP   Department of State Development, Manufacturing, Infrastructure and Planning

DSRM   Design science research methodology

FTE   Full-time equivalent

GRP   gross regional product

IA   Infrastructure Australia

IRR   internal rate of return

LVT   land value tax

MCA   multi-criteria analysis

MPFA   Major Projects Facilitation Agency

PAF   project assessment framework

PMBOK   project management body of knowledge

PMI   Project Management Institute

QT   Queensland Treasury

RDA   Regional Development Australia

RDASC   Regional Development Australia Sunshine Coast

REDS   Regional Economic Development Strategy

SCBC   Sunshine Coast Business Council

SCRC   Sunshine Coast Regional Council

1   BACKGROUND

The Sunshine Coast economy will evolve as initiatives of the Regional Economic Development Strategy (REDS) (Sunshine Coast Regional Council [SCRC] 2013) and broader community are delivered in ways that reshape the built environment and influence the area's employment base. With a goal to grow the economy from $17.2 billion in 2017 to $33 billion in 2033 (KPMG & AEC Group in SCRC 2018c), the REDS is looking to leverage projects to stimulate economic activity. The aspirational goals of the REDS extend to the delivery of a new economy with growing employment opportunities, an increase in the proportion of goods and services exported, and a rise in household incomes (SCRC 2013).

Approaches to economic growth are either neoclassical or neoliberal. The neoclassical approach to economic management and policy setting seeks low and stable inflation, low government debt, and relies heavily on the private sector and market forces (Alexander & Venn 2016). Inflation is considered a federal matter outside the scope of regional economic development. However, the REDS's aspirational goal of growing employment and use of means such as local government spending, is more aligned with an interventionist, neoliberal, or even Keynesian policy.

A Keynesian-style approach to economic planning is evident in the REDS's gross regional product (GRP) target and range of initiatives set to achieve that goal. A conventionally interventionist approach would use Keynesian multipliers to determine the level of new spending to be injected into the economy to meet the GRP gap. At the core of this theory is the idea that new spending will be recycled through the economy and stimulate further growth in consumption (Hefferan 2016). For every dollar brought into the economy a portion may be saved, taxed or spent on imports; however, the remainder that is spent may become another's earnings, and so on.

The formula for the multiplier in a four-sector Keynesian model is $1/(1-c(1-t)+m)$, where c is the marginal propensity to consume, t is the marginal tax rate and m is the marginal propensity to import (Alexander & Venn 2016). As a rough example of the effect of these additional leakages, an estimate or range for the three variables can be formed. If an average 5–15 cents is saved from every new dollar introduced to the Sunshine Coast, c would be 85–95%. With lower household incomes (SCRC 2013), the marginal tax rate for the purpose of this modelling may be assumed to be 20–30%. As a regional area with growing participation in online retailing, the marginal propensity to import may also be 20–30%. The resultant multiplier would therefore be between $1/(1-0.85(1-0.3)+0.3) = 1.42$ and $1/(1-0.95(1-0.2)+0.2) = 2.27$.

In a theoretical application, the multiplier determines the level of new spending required to stimulate consumption and grow the economy to a prescribed level of output. For the Sunshine Coast example, spending $8.8–14.1 billion would see the economy grow from $13 billion in 2013 to $33 billion in 2033. After allowing for inflation of 2.5% per annum, the target of $33 billion reduces to $20.1 billion, or a $7.1 billion increase from the 2013 base of $13 billion. Assuming the multipliers of 1.42–2.27, the new investment needs to be between $3.1 billion and $5 billion, which is roughly the capital investment equivalent of the five 'game changers', or signature projects, in the REDS (SCRC 2013).

In practice, the Sunshine Coast economy has undergone a period of noticeable growth and change since the implementation of the REDS in 2013 (SCRC 2018c). According to the SCRC (2018c), GRP has increased $3.8 billion, or 5.7% per annum, through to 2017. While the Council's implementation report card estimates the economic uplift, it was produced to 'highlight achievements' (SCRC 2018c, p. 2) rather than provide information on whether the estimated economic uplift is a sufficient return on investment. Sunshine Coast business groups such as the Sunshine Coast Business Council (SCBC

2018) have taken the enquiry further with their program to understand how projects may be managed to realise the promised ripple effect.

This research is an extension of the work by the SCBC (2017). It deepens discussion by considering the relationship between projects and the economy. For example, one clear limitation with the current approach to economic modelling is the focus on investment rather than financial injection. An emphasis on game-changer projects—those said to have transformational effects on business, employment and investment growth, and the economy overall (SCRC 2013)—is justified, not only for the initial injection of funds, but the enduring economic benefits these projects provide.

Further limitations and opportunities for improving financial and economic analysis are covered in the review of literature and research in Section 3. The subsequent sections relate to the design of a framework to categorise, measure and deliver projects of significance to the Sunshine Coast region.

2 RESEARCH APPROACH

Design-based research and design science is the approach taken in this research project, as it suits the design of an evaluation framework to enhance the categorisation, measurement and delivery of significant projects in the Sunshine Coast region of Queensland, Australia. Fundamental to this endeavour is the principle that knowledge and understanding of the problem and its solution are acquired in the process of designing and building the artefact. As such, the author carries out the research in the context of an authentic, real-life setting, adopting qualitative approaches to frame the design of the artefact or framework.

In application, design-based research examines the impact of the design or intervention on the learning process. Lessons learned are cycled back into the next iteration of the design innovation (Barab et al. 2005). In project management, as Barab et al. (2005) advocate, further application of design experiments can lead to interventions that are trustworthy, credible, transferable and ecologically valid.

In this research, the design science (Hevner et al. 2004) method proposed by Peffers et al. (2008) is complemented by project management theory; specifically, the project management body of knowledge (PMBOK), and the guidelines and frameworks applied in the initiation and planning of regionally significant projects (Project Management Institute [PMI] 2017a). The PMI (2018) is the leading not-for-profit professional membership association for the project management profession, and the PMBOK Guide sets the foundational standards for the institute. Guidelines and frameworks considered in this research have been identified through a review of literature and past research, as well as systematic engagement with industry participants. Both the review and engagement activities commenced in March 2018 with an agile approach (PMI 2017b) assumed to build, iteratively, an evaluation framework. Engagement activities predominantly comprise meetings and semi-structured interviews with sponsors and key stakeholders in the delivery of regionally significant projects. The de-named program of engagement that contributed to the design of the evaluation framework is presented in Table 2.1.

While design science proved to be an appropriate overarching method to address the research question, complications arose in application, interpretation and communication. Specifically, the objectives-based approach of Peffers et al. (2008) as applied in this research, is not universally accepted as design science methodology. Similarly, the parameters for evaluation in a design science method are not clearly defined, with more rigorous evaluation and testing to be carried out as a subsequent research endeavour.

Table 2.1: Industry engagement

KEY STAKEHOLDER	DATE
Sunshine Coast Business Council board	30 April and ongoing
Development manager from health precinct	30 April and 16 August
Senior executive from regional airport	2 May
Australian Government Members of Parliament and staff	3 May
Australian Government Minister	16 June
Sunshine Coast Chamber Alliance	13 June
Development manager from master planned community	14 June and 16 August
Regional manager of publicly listed property company	14 June
Senior executive from public university	22 June
Senior executive from local council	26 June
Professor of property economics	27 June
Regional Development Australia representatives	27 June
SCRIPT members and stakeholders	28 June
Queensland Government executives in treasury, planning and economic development	31 July
Property Council of Australia executive	2 August
Professor of Regional Engagement	13 August
Australian Government Member of Parliament	6 September
Queensland Government senior executive from Treasury	7 September
Councillor and senior executive from local council	19 September
Sunshine Coast Airport executives, directors and regional stakeholders	27 September

3 REVIEW OF LITERATURE AND RESEARCH

This review has been completed in an iterative manner, with the foundational knowledge relating to the PMI standard, PMBOK Guide (PMI 2017a). Knowledge has been extended through consideration of past research findings. Where empirical evidence narrows, published guidelines and frameworks are reviewed to inform the design of the project evaluation framework. The review commences with projects and their categorisation (see Sections 3.1–3.2), then extends to methods of measurement (Sections 3.3–3.7), and delivery and management.

3.1 Projects

Projects are 'temporary endeavour[s] undertaken to create a unique product, service or result' (PMI 2017, p. 4). The temporary nature means projects have a definite start and finish (Kloppenborg, Anantatmula & Wells 2019; Pinto 2016). The term does not imply a short duration, nor does the word 'temporary' refer to the duration of the project deliverable (Kloppenborg et al. 2019).

Projects are distinct from other organisational processes. According to Pinto (2016), projects take place outside the normal, process-oriented world of a firm. Graham (1992 in Pinto 2016) and Pinto (2016) draw further distinctions, as depicted in Table 3.1.

Table 3.1: Processes and projects

PROCESS	PROJECT
Repeat process or product	New process or product
Several objectives	One objective
Ongoing	One shot-limited life
People are homogenous	More heterogeneous
Well-established systems in place	Systems must be created to integrate efforts
Greater certainty of performance, cost, schedule	Great uncertainty of performance, cost, schedule
Part of line organisation	Outside the organisation
Bastions of established practice	Violates established practice
Supports status quo	Upsets status quo

Source: Graham, in Pinto (2016)

Pinto (2016, p. 25) extends the definition of project by emphasising the need for goal orientation. He proposes projects are developed to resolve a clear goal or set of goals, and asserts 'there is no such thing as a project team with an ongoing, nonspecific purpose'. The PMI (2017a, p. 6) orientate projects as drivers of change:

> *Projects drive change in organisations. From a business perspective, a project is aimed at moving from one state to another state in order to achieve a specific objective. Before the project begins, the organisations commonly referred to as being in the current state. The desired result of the change driven by the project is described as the future state.*

As inherently unique ventures, the classification or grouping of projects is a difficult and somewhat problematic exercise.

3.2 Project classification

The challenge of classifying projects has been met by practitioners and researchers in diverse ways (Crawford, Hobbs & Turner 2002, 2004). Crawford et al. (2002) investigate the potential of classification systems for projects. They found an absence of any generally agreed system or systems for the classification of projects; specifically, 97% of the people interviewed said their organisation develops their categorisation systems internally (Crawford et al. 2004).

Common ways of categorising projects led to three broad groupings: (i) size, risk or complexity; (ii) strategic importance, stage of the life cycle or sector; and (iii) contract form, payment terms or risk ownership (Crawford et al. 2002). Comparably, Kloppenborg et al. (2019) propose four ways to classify projects: industry, size, timing of scope clarity, and application or purpose.

3.2.1 Industry

Besner and Hobbs (2010) consider industry the primary mechanism for project grouping when identifying trends in management toolset adoption. The most popular attribute used to classify projects identified by Crawford et al. (2004) was the application area (56% of responses), followed by sector (15% of responses). The application area relates to the product delivered by the project (Crawford et al. 2004), which relates to a broader industry classification.

3.2.2 Size

There are numerous scale measures to assist project categorisation by size. Kloppenborg et al. (2019) note team number and project duration. Crawford et al. (2004) highlight size and cost (40% and 36% of responses respectively). In an Australian context, investment in Australian dollars (A$) is a measure of project significance. For example, the Queensland Treasury (QT) use estimated capital cost as a threshold for the application of a project assessment framework (PAF). The PAF is applied for Queensland Government related projects with capital costs of $100 million or more (QT 2018b).

A project with an investment exceeding $50 million can gain national 'major project status' if it makes a significant contribution to economic growth, exports, employment and/or infrastructure development (Department of Industry, Innovation and Science [DIIS] 2018). If the project meets the investment threshold and has significant net economic benefit for regional Australia, taking account of a region's investment needs, it can also gain major project status (DIIS 2018). The DIIS (2018) currently have 14 major projects (see Table 3.2), including one telecommunications project in Western Australia. There is one major project located in Queensland, which is a beef processing plant in North Queensland.

While the term 'major project' has a specific meaning in the DIIS, it is not consistently applied in other levels of government. For example, the SCRC (2018b) identify 14 of their own major projects, with no clear benchmarks or thresholds publicly defined.

Infrastructure Australia (IA) (2018b) has four main categories for infrastructure initiatives and projects that make their priority listing. The priority list has two broad groups: projects and initiatives, where an initiative becomes a project when a full business case is positively assessed by the IA Board (IA 2018d). A high priority project or initiative project seeks to 'address a major problem or opportunity of national significance', while priority projects address 'a nationally-significant problem or opportunity' (IA 2018d). IA (2018a, p. 23) does not set explicit investment thresholds in their assessment framework; however, to define whether a problem is nationally significant, the framework states:

> While there are no natural definitions or thresholds for what constitutes a 'material improvement', it is reasonable to categorise problems as either high priority, priority or not a priority on the basis of the monetised costs of the problem or value of the opportunity.

The IA framework is applied to consider submissions against three assessment criteria: strategic fit; economic, social and environmental value; and deliverability (IA 2018a). The IA priority list (IA 2018b) does not report project details but does identify projects, including the Beerburrum to Nambour rail upgrade, which relates to rail congestion and is categorised under 'national

connectivity' (see Table 3.3). There are 14 IA projects on the list, and the Beerburrum to Nambour rail upgrade is the only project specifically identified in the Sunshine Coast region.

Table 3.2: Current major projects

PROJECT NAME	LOCATION	BRIEF DESCRIPTION
Central Eyre Iron Project (renewed November 2016)	South of Wudinna on South Australia's Eyre Peninsula. Cape Hardy in South Australia's Spencer Gulf, approximately 7 km south of Port Neill.	Development of a new magnetite iron ore mine with onsite ore processing facilities. The project will also develop an infrastructure corridor including a standard gauge rail line, a new power transmission line and a new deep-water port.
Chandler Facility (granted April 2017)	Approximately 120 km south of Alice Springs, Northern Territory.	The Chandler Facility will extract salt from an underground mine. The resulting underground voids will then be utilised for storing equipment, archives, and the storage, recovery and permanent isolation of difficult to manage waste materials.
Fibre Expressway Subsea Cable Project (granted March 2017)	Western Australia via Indonesia and Singapore and Malaysia.	The Fibre Expressway project will provide global telecommunications connectivity to Western Australia via Indonesia and Singapore and Malaysia.
Hawsons Iron Project	Broken Hill, NSW.	Hawsons Iron Project is a new $1.7 billion magnetite mine being developed.
Hughenden Beef Processing Plant (granted October 2017)	Flinders Shire, North Queensland.	Development of a beef processing plant and integrated feedlot.
Ichthys Gas & Condensate Field Development (renewed November 2015)	Browse Basin off the Kimberley Coast and plant in Darwin.	Development of gas and condensate fields and construction of a Liquefied Natural Gas (LNG) plant.
Nolans Rare Earth Project (granted September 2016)	135 km north of Alice Springs in the Northern Territory.	Rare earths mine and processing operation.
Prelude FLNG Project (renewed October 2015)	Browse Basin off the Kimberley Coast.	Floating liquefied natural gas (FLNG) facility.
Project Sea Dragon (granted July 2015)	Legune Station in the Northern Territory.	To develop 10,000 hectares of land-based aquaculture.
Renison Tailings Retreatment Project (Rentails) (granted November 2017)	Near Zeehan, North West Tasmania.	A processing plant to re-process existing tailings held in tailing dams.
Sandy Ridge Project (granted April 2017)	Approximately 240 km northwest of Kalgoorlie by road, Western Australia.	Extract Kaolin clay mainly for use in ceramics. The resulting voids will then be utilised for the long-term storage, recovery or permanent isolation difficult to manage waste materials.
Small Scale FLNG Project (granted March 2018)		The project will develop a small scale floating liquefied natural gas (FLNG) vessel.
West Pilbara Iron Ore Project (renewed March 2017)	Western Australia's Pilbara region.	The development of a 30 million tonne per annum iron ore project and associated rail and port infrastructure.
West Seahorse Project (renewed June 2017)	Commonwealth waters off the Gippsland coast in Victoria.	The West Seahorse Project will develop an offshore oil field.

Source: IIS (2018)

Table 3.3: Priority projects

PROPOSED PROJECT	LOCATION	PROBLEM DESCRIPTION	PROPOSED DELIVERY TIMESCALE	PROBLEM CATEGORY
M80 Ring Road upgrade (high priority)	Victoria	Melbourne M80 Western Ring Road congestion	Near term 0–5 years	Urban congestion
M4 Motorway upgrade (Parramatta to Lapstone) (high priority)	New South Wales	Connectivity in outer Western Sydney	Near term 0–5 years	Urban congestion
WestConnex (high priority)	New South Wales	Sydney inner-west road congestion	Near term 0–5 years	Urban congestion
Brisbane Metro (high priority)	Queensland	Brisbane inner city public transport network capacity	Near term 0–5 years	Urban congestion
Monash Freeway upgrade, Stage 2 (high priority)	Victoria	Melbourne southeast and outer southeast congestion New South Wales	Near term 0–5 years	Urban congestion
Sydney Metro: City and southwest (high priority)	New South Wales	Sydney rail network capacity	Medium term 5–10 years	Urban congestion
Western Sydney Airport (priority)	New South Wales	Sydney aviation capacity	Medium term 5–10 years	Urban congestion
Adelaide's north–south corridor: Regency Road to Pym Street (priority)	South Australia	Adelaide north–south urban road network capacity	Near term 0–5 years	Urban congestion
Beerburrum to Nambour rail upgrade (priority)	Queensland	Queensland North Coast rail congestion	Near term 0–5 years	National connectivity
The Northern Road upgrade (priority)	New South Wales	Access to South West Sydney growth area and construction access to Western Sydney Airport	Near term 0–5 years	National connectivity
Inland Rail (Melbourne to Brisbane via inland NSW) (priority)	National	Freight connectivity Melbourne–Brisbane	Long-term 10–15 years	National connectivity
Eyre Infrastructure Project (Iron Road) (priority)	South Australia	Eyre Peninsula freight capacity	Near term 0–5 years	Opportunity for growth
Hobart Science and Technology Precinct (priority)	Tasmania	Opportunity to stimulate economic growth and productivity in Tasmania	Near term 0–5 years	Opportunity for growth
Myalup-Wellington Water Project (priority)	Western Australia	Opportunity to develop industry and agriculture in South West Western Australia	Near term 0–5 years	Opportunity for growth

Source: IA (2018b)

IA's (2018d) internal definition of what constitutes a project is: a 'potential infrastructure [solution] for which a full business case has been completed by the proponent and positively assessed by the Infrastructure Australia Board'. This divergence from the PMI definition may explain why upgrades and other programs and activities are included in the priority list.

The threshold at which a priority project becomes a high priority project is not clearly inferred from the IA list. Conversely, all high priority projects have a problem categorisation of urban congestion.

The state government refers to declared projects of significance, particularly those of economic and social significance, as prescribed projects (Department of State Development, Manufacturing,

Infrastructure and Planning [DSDMIP] 2018). If a prescribed project is 'critical or essential' to Queensland for economic, social or environmental reasons, the Minister may declare it a critical infrastructure project. The DSDMIP list of prescribed and critical infrastructure projects is detailed in Table 3.4.

Table 3.4: Prescribed and critical infrastructure projects

PROJECT NAME	LOCATION	BRIEF DESCRIPTION
Abbot Point Port and Wetland project (Prescribed Project designated November 2014)	Abbot Point	Dredging and construction of a second trestle at the Port of Abbot Point
Byerwen Coal (Prescribed Project designated September 2014)	20 kilometres west of Glenden in Queensland's Bowen Basin	The mine will produce hard coking coal
Gold Coast International Marine Precinct (Prescribed Project designated April 2014)	Gold Coast marine precinct, Coomera	Integrated marine industry facility
Shute Harbour Marina (Prescribed Project designated March 2014)	Shute Harbour	Marina, resort and retail facility
Amrun Project (formerly South of the Embley project) (Prescribed Project designated November 2013)	Embley River, between Weipa and Aurukun	Construction of infrastructure to support mining including a processing plant and port, a dam, tailings storage facility, roads and a ferry terminal
Great Keppel Island Resort (Prescribed Project designated October 2013)	Great Keppel Island	Resort and villa development
Baralaba Expansion (Prescribed Project designated July 2013)	Bowen Basin, Queensland, Australia	Coal mine
Isaac Plains Mining Complex (Prescribed Project designated April 2016)	Moranbah	Coal mine
Ravenswood Expansion Project (Prescribed Project designated December 2016)	65km east of Charters Towers in North East Queensland	Gold mine
Capricorn Copper Mine Refurbishment and Restart Project (Prescribed Project designated April 2017)	125km by road northwest of Mt Isa in North West Queensland	Copper mine
Daydream Island Repair and Refurbishment Project (Prescribed Project designated September 2017)	Daydream Island	Island resort and spa development
Hayman Island Project (Prescribed Project designated September 2017)	Hayman Island	Resort development
Hummock Hill Island Development (Prescribed Project designated September 2017)	Rodds Bay, 30 km south of Gladstone	Residential and tourism development
Adani Combined Project (Critical Infrastructure Project designated October 2016)	North Galilee Basin approximately 160km northwest of Clermont in Central Queensland	The Carmichael coal, railway and port project includes building Australia's largest thermal coal mine linked by a new rail line to a new terminal at Abbot Point
Kidston project (Critical Infrastructure Project designated June 2018)	North Queensland	A renewable energy hub integrating large-scale solar with pumped storage hydro

Source: SDMIP (2018)

The list of prescribed and critical projects is diverse, with few threads or similarities. The natural resources projects may reach a sufficient scale for investment and job creation, but that threshold is not reported. The declaration of resort and villa developments may be harder to define in a quantitative manner. In many cases, the hospitality assets are redevelopments initiated after natural disasters. As such, they may not meet the PMI definition of a project '[creating] a unique product, service or result' (PMI 2017a, p .4).

The Queensland Government (DSDMIP 2018) defines projects in another manner through the Catalyst Infrastructure Program. The program presents catalyst infrastructure as 'the construction of physical networks, or "hard" infrastructure, which is necessary to unlock development, generate construction and create long-term employment' (DSDMIP 2018). According to DSDMIP, Maroochydore City Centre and Caloundra South are classified as catalyst infrastructure projects with the Queensland Government entity, Economic Development Queensland, acknowledged as the development approval authority. The Bright City and Aura projects, located in the Sunshine Coast, meet the criteria that extends to projects generating, facilitating or accelerating economic benefit and job creation.

Catalyst, or more accurately 'catalytic projects', is terminology adopted by Regional Development Australia Sunshine Coast (RDASC). RDASC (2018) does not specify how a project gains catalytic status. They say eight out of the 15 nominated projects are either priority transportation infrastructure projects or digital infrastructure and projects that support smart communities.

Some of the Sunshine Coast region catalytic projects (see Table 3.5), may be more accurately described as a systematic series of activities directed towards improving a product, service or result. For example, the Bruce Highway upgrades may be an operation or process when considering the findings of Graham (1992 in Pinto 2016), as detailed in Table 3.1. The budget for the highway works is substantial with benefits to the local economy worth considering in an economic analysis. However, the works are aimed at improvement and efficiency (Department of Transport and Main Roads [DTMR] 2018) rather than 'creating a unique product, service or result' (PMI 2017a). Further, the Bruce Highway upgrade program fails to satisfy the requirement of a project to be a temporary endeavour. The program has timeframes related to funding of 10–15 years; however, there is a provision for rolling action plans. The rolling action plans and potential for other upgrades after the program horizon further supports the notion that the program may be better understood as an operation, process or management program of the state and national governments than a 'project', as defined by the PMI (2017a).

Table 3.5: Catalytic projects

NAME	BRIEF DESCRIPTION
Peregian Digital Hub	Noosa Shire Council is developing a modern, flexible, shared workspace called the Peregian Digital Hub to assist the local economy to grow. A shared workspace for a range of complementary activities, including commercial businesses, public sector and community organisations. It offers high-speed and cutting-edge technical facilities and services, as well as meeting rooms, event and training spaces, with a focus on bringing people together. The cost of the project is over $3 million.
Sunshine Coast Solar Farm	>$10 million economic benefit.
Sunshine Coast Airport Expansion	New infrastructure and facilities enabling enhanced domestic and international flight access to the region. This will also facilitate new freight capabilities and more direct access to global markets. Expansion costs $347 million.
Sunshine Plaza Expansion	$400 million shopping centre expansion.
Maroochydore Bright City (SunCentral)	Maroochydore's New Central Business District is a greenfield site being transformed into a new smart city in the geographic centre of the Sunshine Coast. The Maroochydore city centre will have a strong focus on innovation and technology, and excellence in urban design. The 53-hectare site includes prime commercial office space, retail, residential and cultural precincts, an entertainment, convention and exhibition centre, all surrounded by extensive parks and waterways. This project will create a new central business district for the Sunshine Coast and an estimated 5,000 new jobs by 2020, and 15,000 new jobs by 2025. This project will provide a $4.4 billion boost to the Sunshine Coast economy.
Mooloolah River Interchange (MRI)	To provide the transport capacity needed to support the Sunshine Coast University Hospital precinct. This is a new two-lane motorway connecting Caloundra, the Hospital precinct, and Mooloolaba to Sunshine Coast motorway, costing $440 million.
Sunshine Coast University Hospital, Health Hub and Skills Academic and Research Centre	Public hospital $1.8 billion, Private hospital $150 million, and research centre $60.8 million.
International Submarine Broadband Cable	$700 million economic benefit regional economy (proposed).
Oceanside	Australia's healthiest city by the beach ($13.3 billion contribution to economy 2013).
North Coast Rail Duplication	Duplication of the track, extensions of existing passing loops and improvements to stations between Beerburrum and Nambour stations to facilitate greater flexibility and passing opportunities, improving the efficiency of both passenger and freight services, at a cost of $540 million.
Harmony (Palmview)	Residential development ($3 billion construction).
Bruce Highway upgrades	Highway upgrades that will reduce travel times and traffic congestion, improve safety, increase efficiencies in long distance road freight, and support the needs of local communities including tourism traffic ($1.3 billion).
Aura—City of Colour	Caloundra South Priority Development Area ($7 billion + investment).
Sunshine Park	$90 million project (Proposed).
CAMCOS—Caboolture to Maroochydore Corridor Study	Passenger rail service branching off the North Coast railway line at Beerwah and extending through Caloundra to Maroochydore. The proposed rail line will provide a public transport spine for the Sunshine Coast and link the coastal urban area to Brisbane (over $1 billion for entire corridor–first stage $480m).

Source: RDASC (2017)

The SCRC provides a further classification of some projects defined by the RDASC. There are three main terms or classifications discussed in the council publications: major projects, region building ventures, and game changers. As discussed earlier, major projects is a term shared by the federal government to classify 14 projects; yet, not one of the projects is acknowledged by the DIIS (2018) as having major project status.

Region building ventures and regional game changers appear to have similar meanings, with most identified projects covered in both categories. The terminology 'game changers' may relate to an earlier regional economic strategy where, in a discussion on the new economy, it was predicted that game-changer projects would have 'transformational effects on business, employment and investment growth—and the economy overall' (SCRC 2013, p. 14). There are no clear definitions or thresholds for defining a game-changer project; however, reference is made to the projects as 'transforming the Sunshine Coast economy and its employment base, and generating an array of associated investment opportunities' (SCRC 2018a, p. 19). The designated Sunshine Coast regional game changers are identified in Table 3.6.

Table 3.6: Sunshine Coast regional game changers

PROJECT NAME	BRIEF DESCRIPTION
Australia's only greenfield CBD at Maroochydore (underway)	A new 21st century city centre with commercial, retail and residential investment opportunities, including a premium international hotel, is being developed on a 53-hectare site owned by the Sunshine Coast Council.
Expansion of the Sunshine Coast Airport (underway)	This will provide the region with a new international gateway and will be completed by 2020. The project includes the construction of a new 2,450 metre runway and increased apron facilities and is forecast to contribute $4.1 billion to the economy through to 2040.
Bruce Highway upgrade (underway)	The project involves upgrading and widening the Bruce Highway to six lanes to provide vital community infrastructure and is designed to meet the strategic transport needs of the Sunshine Coast region in this area well into the future. Construction of Phase 1 is expected to be completed in late 2020.
Tertiary teaching hospital campus (completed)	The new Sunshine Coast University Hospital, incorporating the $60.8 million Sunshine Coast Health Institute, was officially opened in April 2017. The hospital opened with close to 450 beds and 3,000 staff with the capacity to grow to approximately 738 beds and 4,600 staff by 2021.
International broadband connection (planned)	A new submarine cable to be brought ashore on the Sunshine Coast will deliver faster, more reliable and affordable broadband connectivity for Queensland, providing greater bandwidth for new business and research institutes. The project is forecast to generate an additional $453 million to the Sunshine Coast economy every year and $927 million annually to the state's economy.

Source: SCRC (2018a)

As noted earlier, upgrading and widening the Bruce Highway may not meet the definition of a project (PMI 2017a). However, projects other than the highway upgrade appear to fit the PMI project definition, having envisaged start and end dates with each creating a unique product or service. For example, while the airport may be considered an extension of existing infrastructure, the purpose is to provide a new international gateway (SCRC 2018a). Similarly, the city centre description refers to it being the only greenfield CBD, and the hospital incorporates a new health institute.

The themes in the project narratives assist with understanding what the council considers a game-changing project. There are single point references to project scale in terms of industries or uses, land area, runway length, lanes and investment, and staffing and bed capacity, which are raised

twice in the hospital discussion. Multiple references are made to financial contributions to the economy (see Section 3.3).

3.2.3   Timing of scope clarity

IA categorise infrastructure on their priority list as either a project or initiative, depending on approval stage (IA 2018d). When a full business case is positively assessed, the initiative becomes an infrastructure project. An initiative may be refined as it moves through the assessment framework, and IA Board approval is regarded as a quasi-scope acceptance stage. However, projects are inherently unique (PMI 2017a) and the timing of scope clarity can be more dependant on the nature of the project than the prescribed authority, sponsor or proponent's process.

For example, Kloppenborg et al. (2019) contrast scope clarity in the development of a parking lot and development of a new pharmaceutical. The parking lot has a clear and certain scope, requiring an estimation of concrete to pour and the associated work required. On the opposite end of the spectrum, a new pharmaceutical may require experimentation and analysis before determining costs or schedules with any certainty. The planning for the pharmaceutical becomes iterative and may be better suited to an agile project management method (Kloppenborg et al. 2019).

Agile techniques and approaches are designed to effectively manage disruptive technologies and high-uncertainty work (PMI 2017b). High-uncertainty projects have high rates of change, complexity and risk. As such, they present problems for more traditional, predictive approaches that aim to determine the bulk of the requirements upfront and control changes through change request processes (PMI 2017b).

The planned international broadband connection (SCRC 2018a) is an example of a project that may benefit from an agile approach to project management. For example, GQI Consulting (2017) and SCRC (2018a) clearly identify the benefits of the proposed project as a foundation for economic growth and enabler of reliable and affordable broadband connectivity. Yet, there are a multitude of delivery options being considered, with the submarine options requiring protection zones prior to market testing and requests for proposals.

3.2.4   Application or purpose

The purpose or application of a project is another way to categorise or classify a project. Kloppenborg et al. (2019) refer to projects as responses to organisational change, quality and productivity improvement, research and development, information systems and construction. The projects discussed in terms of size (see Section 3.2.2) each have set aims and objectives related to the business case and project charters detailed by the PMI (2017a). However, the projects are generally of a scale that warrants classification or facilitation from the various levels of government involved.

As previously noted, a project can gain national major project status with the DIIS (2008) if it is expected to satisfy an investment hurdle and makes a significant contribution to economic growth, exports, employment and/or infrastructure development; or, if the project has significant net economic benefit for regional Australia, taking account of the region's investment needs.

Strategic fit is one of the three criteria for assessing projects through IA's framework, which it defines as being when 'the initiative will address problems or opportunities of national significance that constrain the achievement of stated goals' (IA 2018a, p. 15). With the Beerburrum to Nambour rail upgrade, the strategic context narrative refers to population growth alignment with the South East Queensland Regional Plan (IA 2018c). It also refers to the Sunshine Coast's regional economic activity centres moving eastward, and proposes how the project will enable the 'development of

new public transport options for improving connectivity within the Sunshine Coast' (IA 2018c, p.3). The Beerburrum to Nambour rail upgrade evaluation summary does not define the new transport solutions the project claims to enable. Yet, the strategic intent presents the upgrade as part of a greater project or portfolio addressing new transport solutions to link the Coast's eastern activity centres (IA 2018c).

In Queensland, the DSDMIP (2018) prescribe projects based on significance, particularly economic and social significance. Comparably, they define catalyst infrastructure in terms of the potential to unlock development, generate construction and create long-term employment (DSDMIP 2018).

As a local government, the SCRC considers game-changer projects as those that transform the Sunshine Coast economy and employment base, and generate associated investment opportunities (SCRC 2018a). The four projects in the council's suite of game changers may or may not be specifically designed to meet the authority classifications, and there is some evidence of Keynesian interventions where the economic impact of the project is discussed. Conversely, there is no evidence of project investment being quantified or timed, as with an interventionist policy. While being able to confirm the original intent may assist with classification, projects evolve as scope is refined (PMI 2017a). Therefore, it may be more prudent to consider application and potential impact over the project originator's intent.

3.3   Project selection

Leaders initiate projects in response to factors acting upon their organisations (PMI 2017a). According to the PMI (2017a), there are four categories of driving factors that:

- meet regulatory, legal or social requirements
- satisfy stakeholder request or needs
- implement or change a business to technological strategies
- create, improve, or fix products, processes or services.

These elements are often expressed in strategic objectives, which are how the organisation achieves its mission and vision (Kloppenborg et al. 2019; PMI 2018). The project objectives are 'something toward which work is to be directed, a strategic position to be attained, a purpose to be achieved, a result to be obtained, a product to be produced, or a service to be performed' (PMI 2017a, p. 712). Fulfilling these objectives, or intent, is how projects work to initiate change and introduce unique products, services or results.

There are several different methods of systematically selecting projects. Pinto (2016) refers to two classes of project selection models—numeric and nonnumeric—which are similar to Kloppenborg et al.'s (2019) 'financial' and 'scoring' models. There are a range of scoring or nonnumeric models to assist leaders and managers in choosing appropriate projects to pursue. Generally, they have predetermined criteria related to strategic objectives and financial returns (Kloppenborg et al. 2019; Pinto 2016) and may be subject to methodological flaws. The primary reason for including financial analysis in project selection relates to the perspective that projects are a form of investment. Kloppenborg et al. (2019, p. 43) identify three approaches that ensure both financial and nonfinancial factors are considered when selecting projects:

> [S]ome organisations use financial analysis as the primary means … some organisations use financial models as screening devices to qualify projects or even just to offer perspective … third, at still other organisations, financial justification is one factor used in multiple factor scoring model.

Multiple factor or multi-criteria analysis (MCA) has methodological limitations (see Section 4.2). However, there are a number of ways to improve the application of MCA and its robustness. IA (2018a, p. 87) suggest 'the simplest way [to improve the rigor of MCA] is to incorporate more quantitative criteria such as cost estimates and measures of demand'.

Cost–benefit analysis is an example of a 'financial analysis tool used to determine the benefits provided by a project against its costs' (PMI 2017a, p. 703). The related financial models compare expected project costs to expected project benefits. The several models used to evaluate projects are outlined in Table 3.7.

Table 3.7: Financial models for project selection

FINANCIAL MODELS FOR PROJECT SELECTION	NET PRESENT VALUE (NPV)	BENEFIT–COST RATIO (BCR)	INTERNAL RATE OF RETURN (IRR)	PAYBACK PERIOD (PP)
Calculation	PV revenue – PV costs	Cash flow/Project investment	Percentage return on project investment	Project costs/annual cash flows
Neutral result	NPV = $0	Ratio = 1.0	IRR = cost of capital	Payback period = accepted length
If used to screen projects or to select projects outright	NPV > Acceptable amount	Ratio > acceptable amount	IRR > Acceptable amount	Payback period < acceptable length
If used to compare projects	Higher NPV better	Higher ratio better	Higher IRR better	Shorter payback period better

Source: Kloppenborg et al. (2019)

Financial models are generally applied by the initiating organisation to assess the viability of the project (Kloppenborg et al. 2019; Pinto 2016); however, the models can also assess a project's economic impact on the community.

From a governmental perspective, the results of financial and economic analyses significantly affect the final determination of a project's priority and affordability (QT 2015c). QT consider financial analysis to determine the financial impact of each alternative project option on the government, and the economic analysis, which assesses the option that creates the largest net economic benefit to the state. They further distinguish financial and economic analyses:

> *Financial analysis considers the cash flow consequences of the project options from an internal financing perspective while the economic analysis looks at the overall impacts of the project options on the economic welfare of the community (QT 2015c, p. 5).*

Measuring return on investment in financial analysis, and measuring economic impact, are primary considerations in project selection and performance.

3.4   Measuring return on investment

The financial feasibility of a single project for the sponsor or developer can be measured using static analysis in the form of profit projections, with forecast returns measured as a margin, payback period or benefit-to-cost ratio. For larger scale projects, developers employ a more dynamic modelling process where the time value of money is explicitly considered. The most popular form of dynamic analysis relates to cash flow projections and the measurements of internal rates of return and net present value.

Similar measures are adopted by the state government and local authorities when evaluating the potential benefits of pursuing significant, game-changing projects. For example, when considering

the environmental impact of the Sunshine Coast Airport expansion, the economic assessment considered two separate sets of potential project benefits. The first, net economic benefits, utilises benefit–cost analysis (or cost–benefit analysis) techniques to estimate whether the benefits of the expansion outweighs the costs from Queensland Government's perspective (SCRC 2014b). For the SCRC (2014b), input/output modelling techniques can be used to estimate the contribution of the project to GRP and regional employment.

3.4.1   Financial feasibility and analysis

In development, a profit is reached when the revenues exceed expenses or costs. Coleman et al. (2013, p. 146) refer to Ricardo's Law or Rent, stating that development appraisal or valuation methods 'are based on the premise that the value of a development project or site is taken as the monetary residual or surplus available once a site has been developed'. As such, the fundamental development profitability equation may be simply represented as *profit = revenue less costs*. Expanding the equation, the API (2007a) propose that feasibility is indicated when the market value or gross realisation of a project upon achievement of a stabilised condition, equals or exceeds all costs of production.

Detailed feasibility models have been developed and employed to better forecast profitability and, in turn, make more informed decisions about the likely financial success of a development scheme. Broadly, the models used to value development properties and forecast returns from proposed development projects in Australia may be classed as either static or dynamic analysis (API 2012). Static analysis is defined by the Australia and New Zealand Real Property Guidance Note as:

> *Static Analysis—With this approach costs are generally summated as at the date of completion of the project and income is assessed as at the same date with allowances for vacancies and letting up periods. This is the less complex financial analysis which is suitable for preliminary feasibility studies and for calculating profit and risk or land value. A 'static analysis' assumes no change in prices or costs during the period of development. (API 2012, p. 173)*

Dynamic analysis allows for potential movement in prices and costs over the period of the development (API 2012). This more complex form of financial analysis is most accurately applied through the discounted cash flow (DCF) method. Cash flow models are more precise in terms of the actual timing of revenue and expenditure over the development period (Coleman et al. 2013; Wilkinson & Reed 2008), and extend the ability of operators to model more complex developments with more sophisticated funding arrangements (Havard 2014). QT (2015c, p. 6) supports the use of dynamic analysis through their PAF, which states that, 'for project options with costs and revenue extending over long periods, calculation of the net present financial value will enable a practical comparison of options'.

With advances in technology and education, DCFs have become the pre-eminent industry tool for valuing complex development projects of a staged or longer-term nature (Coleman et al. 2013; Havard 2014). Support for the use of DCF models in valuing larger development property with phased schemes is noted in the API's text, *Valuation Principles and Practice* (API 2007b) and the feasibility studies guidance note of the Valuation and Practice Standards (API 2012). In valuing englobo or subdivisional land, the API (2007b, p. 180) places an onus on the valuer to select the appropriate primary valuation methodology, with the generalisation that, 'as projects become larger and more complex, greater weight will be put on Discounted Cash Flow Analysis'.

The feasibility of the SCRC's proposed international broadband submarine cable project is based on DCF analysis. On behalf of the council, GQI Consulting (2017) model four different options through

15- and 35-year DCFs. The primary output from the models is the internal rate of return (IRR). The hurdle rate or project IRR sought is 15%, which GQI Consulting (2017) discuss as typically required for a submarine cable project to be viable.

In the public sector, financial DCF analysis is normally undertaken from the perspective of a government department or agency, or a government-owned corporation (Building Queensland 2016). Financial analysis is applied to assess the affordability of options in terms of cash flow for the respective organisation. According to Building Queensland (2016, p. 32), the provider of independent advice to the Queensland Government, the analysis includes 'direct financial and accounting impacts including cash flows from user charging'. Capital and operating costs are analysed separately.

Focusing on a single government department or agency, or a government-owned corporation, as recommended by Building Queensland (2016), can potentially limit the DCF analysis. By specifically excluding taxation from the financial analysis, there is no capacity to model the impact a project may have on other departments or government organisations. As discussed in Section 3.7, the land value uplift from a project may lead to greater revenue through land tax. This cannot be captured in the current approach to public sector financial analysis; however, the land use impact may, in part, be modelled through economic analysis.

Thus, financial analysis should be extended to consider the whole government, not just a department or agency.

3.5   Measuring economic impact

Economic analysis builds on financial analysis with the addition of other impacts and benefits that are not directly captured or incurred by the sponsor (QT 2015c). Discussing economic impact, Squire and Van der Tak (1975, p. 4) propose:

> [I]n assessing the merits of different projects, the objectives of any particular society clearly must be taken into account. That is, project costs and benefits must be measured against the extent to which they detract from, or contribute to, achievement of that society's objectives.

They consider two primary and simultaneous objectives: to increase the total national income (the growth objective), and improve the distribution of national income (the equity objective).

While contemporary society's objectives may be depicted differently, economic impact studies have become commonplace (Morgan & Condliffe 2006). They have been used to assess returns on investment from a wide variety of tourism projects including, but not limited to, convention centres, hotels, stadiums, museums, entertainment events and sporting events (Morgan & Condliffe 2006).

Regardless of the intervention being assessed, the purpose of an economic impact analysis is to measure the broader economic benefits that a defined community accrue (Crompton 2006; Siegfried et al. 2007). Crompton (2006) emphasises community impact, and proposes defining the economic impact as the net economic changes in the incomes of host residents, not the proportion of total return that filters back to the council. Thus, Crompton (1995, p. 15) demonstrates economic impact by delineating between a local authority and ratepayers:

> Residents of a community 'give' funds to their city council in the form of taxes. The city council uses a proportion of these funds to subsidize the production of an event or the development of a facility. The facility or event attracts out-of-town visitors, who spend money in the local community both inside and outside the facility they visit. This 'new money' from outside the community creates income and jobs in the community for residents. This completes the cycle-

community residents are responsible for creating the funds, and they receive a return on their investment in the form of new jobs and more household income.

3.5.1 Approaches to measure economic impact

Caffrey and Isaacs (1971) have influenced many studies devoted to the economic impact of various universities worldwide (Pastor, Pérez & de Guevara 2013; Siegfried, Sanderson & McHenry 2007). According to Pastor et al. (2013), the methodology for assessing the economic impact of universities consists of:

- identifying the agents that generate the economic impact of universities (university spending on goods and services, their staff, the students and their visitors receive)
- estimating their spending in the local economy and
- calculating the total economic impact on the economy by applying multipliers.

There are a variety of methods available to assess economic impact in disciplines and industries other than higher education. For example, in tourism and hospitality, Morgan and Condliffe (2006) identify the three most popular:

- Multiplier analysis—a quantification of the relationship between an original change in economic activity and the ultimate change in activity. The analysis seeks to attribute a multiplier to represent the money that is spent and re-spent through various sectors of the economy.
- Input-output analysis—describes the economic linkages that exist within a regional economy.
- Computable general equilibrium modelling—combines the sector detail and geography detail of input/output models but provide for functioning economic linkages between sectors and regions over time.

To resolve methodological shortcomings and over-reliance on subjective multipliers, many approaches have been extended. Pastor et al. (2013) include simulation in their modelling to better allow for uncertainty and diverse spending patterns. In the United States (US), a series of models have been developed to better assess the economic impact of events and tourism facility development. Bonn and Harrington (2008) examine the differences between three economic impact models: the capacity utilisation model (CUM), Regional Economic Models, Inc. (REMI) and the impact analysis for planning (IMPLAN) model. CUM uses the hotel/motel industry as a baseline and quantifies the economic impact (labour and fiscal) of tourism on the local economy. The IMPLAN model is an input-output model that assumes the flow of products from each industrial sector (producer) to each of the industrial sectors considered as consumers (Pastor et al. 2013). According to Pastor et al. (2013), REMI 2002 is a dynamic, integrated input-output and econometric model. The basic assumption of REMI is that it is based on theoretical structural restrictions rather than individual econometric estimates based on single time-series observations for each region.

Similar measures are adopted by the state government and local authorities when evaluating the potential benefits of pursuing game-changer projects (see Section 3.4).

To model the economic benefits of the proposed international broadband submarine cable, GQI Consulting used the computable general equilibrium (CGE) modelling methodology. According to GQI Consulting (2017) the CGE model used—the Cadence Economics general equilibrium model—is a dynamic model of the Sunshine Coast, Queensland and Australian economies that embodies changes in those economies' industrial and occupational structure. The model accounts for input supply-side constraints and consequent input price rises when demand for these inputs (such as

labour) increases, which is why CGE modelling is favoured when analysing the flow-on effects of projects (GQI 2017).

3.5.2   Accuracy and constancy in economic modelling

The published findings of studies focused on economic impact modelling accuracy present consistent findings across disciplines and interventions. Often, reviews criticise the application of economic impact modelling, citing outcomes that do not reflect projections, or instances of erroneous application (Crompton 1995, 2006; Morgan & Condliffe 2006). Crompton (1995, p. 18) is particularly scathing of applied economic impact modelling in the US tourism and hospitality industry:

> *[A]buses incorporated in an economic impact analysis are contagious because when precedent has been established in one study, other sponsors may feel compelled to perpetuate the abuse by incorporating the misleading procedures in their own analyses. If they fail to do so, then the economic impact attributed to their sports event is perceived to be lower than that reported by others, and thus less worthy of public investment.*

There is some conjecture as to whether the errors in economic impact modelling stem from misunderstanding or deliberate misrepresentation (Crompton 1995). However, the major contributors to inaccurate economic impact modelling are:

- instructions and intent of the analysis
- new money injected or not
- variations and incorrect selection of the study area
- inappropriate multipliers applied
- leakages not analysed or applied appropriately
- negative economic externalities not analysed or applied appropriately.

Instructions and intent of the analysis

The purpose and end use of economic impact analysis needs to be considered upfront. Crompton (2006) discusses ethical work and the role of the individual and institution when providing impact analysis in his concluding remarks of a paper titled 'Economic impact studies: instruments for political shenanigans?'. While there are ethical practices to follow, there is inherent conflict when the sponsor has an identifiable interest in the result of the economic impact study (Morgan & Condliffe 2006). Crompton (1995) and Morgan and Condliffe (2006) cite Hunter's (1988) earlier finding that, 'the political reality of economic impact analyses is that they are frequently undertaken to justify a position that either sports organizations or community elected officials have adopted or are proposing'.

Even if the analysis is conducted in an ethical manner and the report presents rigorous findings, there are no assurances that research will lead to informed decision-making. Morgan and Condliffe (2006, p. 85) discuss the need to inform end users that 'an economic impact study by itself provides only a narrow focus of the economic benefits'. They also note that policy-makers like to have a number to focus on, without necessarily considering the assumptions and limitations of the study.

To assist with communication and comprehension, Siegfried et al. (2007) suggest studies of public universities should stop claiming that for every dollar spent, the university returns X dollars. They consider the statement to be meaningless at best, and:

> *at worst, [the economic analyst] may delude decision-makers into thinking (incorrectly) that the marginal return on investment in higher education is several orders of magnitude more than returns on other public investments. If the returns to higher education were as high as these*

statements imply, states and the private sector would be building universities frantically (Siegfried et al. 2007)

Further, Siegfried et al. (2007) recommend that higher education institutions stop reporting a single impact in two formats to mislead readers into thinking benefits are larger than in reality, as financial impact and jobs impact are alternative measures of one concept.

New money injected or not (opportunity cost)

An assessment of economic impact requires a defined catchment area and impacted community on which to focus the study. The need for a consistent study area is essential to accurately quantify what is new money entering the economy and how any multiplier may be applied (Siegfried et al. 2007). In reviews conducted by Crompton (1995, 2006) and Morgan and Condliffe (2006), instances of double counting are highlighted, which lead to inflated statements of a project's economic impact.

New money can be injected into an economy by visitors, media, external government entities or banks and investors from outside the community attending an event (Crompton 1995). If it is not new money that is introduced into the community, then it could have been spent on other activities and should not form part of the economic impact analysis (Crompton 1995, 2006). When considering new money and the economic impact of a university on a defined catchment, Siegfried et al. (2007, p. 548) propose:

> *the extent of economic activity so affected depends on the scope of the relevant area, the capacity of alternative local suppliers of services to substitute for those produced by the institution and the extent to which consumers would accept alternative suppliers. For example, a university that attracts students who otherwise would [enrol] at other institutions in the same metropolitan area does not draw many new students or dollars to the area if the other colleges can increase their [enrolment]. In contrast, an isolated rural college is likely the sole local attraction to its students, and thus reasonably might be credited with virtually all of the impact stimulated by its students' expenditures.*

Variations and incorrect selection of the study area

As already noted, an economic assessment requires a defined catchment area and community. The area should fit the purpose of the impact study and the boundaries need to be consistent throughout the analysis (Crompton 1995; Siegfried et al. 2007). Changes in the geographical boundaries of a study area are likely to lead to changes in multiplier size, because the magnitude of a multiplier depends on the structure of the host community (Crompton 1995). It would be inappropriate to use a small area to identify a substantial proportion of revenues as export, and then adopt an off-the-shelf multiplier that has been calibrated on the basis of a larger area that experiences few leakages (Siegfried et al. 2007).

Inappropriate multipliers applied

Multipliers are applied to economic analyses based on a misunderstanding of direct and indirect impacts. Crompton (1995) uses a sporting event to explains this problem. A group of spectators from another area come to see a sports event and spend $10,000 in a community. This initial direct expenditure stimulates economic activity and creates additional business turnover, employment, household income and government revenue in the host community (Crompton 1995). According to Crompton (1995), this ripple effect in an economy, or multiplier, may be categorised as:

- direct impact (first round effect of visitor spending)
- indirect impact (ripple effect of additional rounds recirculating initial dollars)
- induced impact (further ripple effects caused by employees of impacted businesses spending some of their salaries and wages in other businesses in the region).

There are many problems with forecasting indirect or induced impacts. For example, associated spending may bring little new expenditure from outside the region, and instead simply reallocates expenditure within the community (Morgan & Condliffe 2006). Thus, it would be inappropriate to allocate a multiplier derived from direct impact to indirect or induced spending (Crompton 1995, Morgan & Condliffe 2006).

Leakages not analysed or applied appropriately
Morgan and Condliffe (2006, p. 88) state that 'the initial expenditures have a ripple effect through the economy as successive rounds of spending magnify its impact'. Yet, it would be misleading to assume that additional demands are satisfied by local businesses rather than a mix of local and non-local businesses. Ignoring the leakages from the local economy may lead to an inflated economic assessment (Morgan & Condliffe 2006).

Negative economic externalities not analysed or applied appropriately
Studies may fail to account for negative economic externalities in their measurement of economic impacts such as traffic congestion and disruption to resident lifestyles. Crompton (1995) observes that too often, only positive economic benefits associated with visitors are reported, and costs or negative impacts inflicted on a community are not considered. Further, what constitutes an economic impact of an event is often confused, either mistakenly or deliberately (Crompton 1995).

Considering the economic impact of higher education, Siegfried et al. (2007) express the requirement for the study to be designed to measure local impact in terms of how much better off residents are than in its absence. They see proper procedure comparing economic indicators in the presence of the institution with 'predictions of those same indicators "but for" the college—that is, compare actual to "counterfactual" outcomes' (Siegfried et al. 2007, p. 548).

By framing and guiding investment and economic analysis, some of the mentioned shortcomings may be overcome.

3.6   Framing investment and economic analysis
There are a range of processes and frameworks to guide investment decision-making across private and public sectors. Frameworks and guidelines for infrastructure and transport projects in Australia are provided by Australian Transport Assessment and Planning (ATAP) (Department of Infrastructure and Regional Development [DIRD] 2018a) and IA (2018d). Public projects in Queensland are supported by the Queensland Government PAF (QT 2015c) and the independent advisor, Building Queensland (2016).

The agencies and frameworks are applied within different contexts with set purposes (see Section 3.1); however, there is consensus in the preferred approach to appraising or evaluating the economic impact of a project or initiative. Cost–benefit analysis (CBA) is the primary method of economic evaluation of public sector policies and projects (Building Queensland 2018; IA 2018a; DIRD 2018a; QT 2015b). The economic evaluation and appraisal methods supported in the Australian and Queensland frameworks and guidelines are detailed in Table 3.8.

Table 3.8: Economic evaluation and appraisal methods

ECONOMIC EVALUATION/ APPRAISAL METHODS	AUSTRALIAN TRANSPORT ASSESSMENT AND PLANNING	INFRASTRUCTURE AUSTRALIA (2018)	BUILDING QUEENSLAND (2016)	PROJECT ASSESSMENT FRAMEWORK (QT 2015b)
Preferred/recommended approach/ technique(s)	Cost–benefit analysis (CBA)	Cost–benefit analysis (CBA)	Cost–benefit Analysis (CBA)	Cost–benefit analysis (CBA)
Acceptable approach(es) with expressed limitations	-	Cost effectiveness analysis (CEA) Multi-criteria analysis (MCA)	Cost effectiveness analysis (CEA)	Cost effectiveness analysis (CEA)

Source: Building Queensland (2016); IA (2018a); DIRD (2018a); QT (2015b)

3.6.1   Cost–benefit analysis

A form of DCF analysis (see Sections 3.4 and 3.5), CBA is a method used to make decisions about alternative courses of action based on the net welfare gain to the community, as measured by criteria such as net present economic value and benefit–cost ratio (QT 2015c). The net present economic value is said to allow 'project options to be compared on the same basis and hence allows the determination of the greatest net benefit to the community or the most economic use of resources' (QT 2015c, p. 6).

CBA is undertaken at various levels of analysis. For example, IA (2018a) refer to 'rapid CBA' to support a preliminary/strategic business case, and a 'detailed CBA' is applied to the final business case. The analysis can be used for distinct levels of scope and on several types of interventions (IA 2018a). The respective PAFs generally detail the level of CBA required. For example, in Queensland, Building Queensland (2016) determine the necessary level of analysis on an infrastructure project or proposal through a business case framework specifically aligned with the Queensland Government's PAF (see Table 3.9).

Table 3.9: Integration of CBA with the Building Queensland's business case development framework and project lifecycle

CBA in a Project Lifecycle	STRATEGIC BUSINESS CASE	PRELIMINARY BUSINESS CASE	DETAILED BUSINESS CASE
Purpose	Needs analysis	Option analysis	Project/option selection
Application of cost–benefit analysis (CBA)	No	Yes	Yes
Approach	Identify expected economic, social and environmental outcomes	Preliminary (strategic) CBA of multiple options. Initial quantitative description of economic, social and environmental outcomes. Economic appraisal of direct costs, including direct project construction and operation costs for each option. Initial analysis of benefits of each option	Detailed CBA, plus any initial market soundings. Highly detailed analysis of refined option. Estimate economic values for economic, social and environmental outcomes. Economic appraisal of all costs and benefits for the preferred option
Output	Qualitative description of outcomes, with some quantification where available—identifies options for preliminary business case	Preliminary CBA, with some sensitivity analysis. Identifies preferred option for detailed business case, justified on strategic benefits	Detailed CBA with sensitivity analysis. Describe net economic benefit and qualitative information. Net present value, benefit–cost ratio and detailed breakdown of benefit streams identified. Identifies preferred option to go out to market
Alignment	PAF strategic assessment of service requirement	Alignment: PAF preliminary evaluation	PAF business case

Source: Building Queensland (2016)

3.6.2   Cost effectiveness analysis

Cost effective analysis (CEA) is an alternative approach discussed by IA (2018a), Building Queensland (2016) and QT (2015c). While it is considered an acceptable approach, there are limitations to its application. CEA relies on developing a metric involving the quantitative (un-monetised) benefit and total costs of the options being assessed (Building Queensland 2016). IA (2018a) utilise CEA to compare costs against a specified level of service or output; however, the analysis does not seek to place a value on the outputs that provide benefits to the community. As such, CEA is used when the size or value of benefits are not what differentiates the options. This is essentially a 'least cost' approach for the same output (IA 2018), and does not provide insight into whether the selected option provides a net economic benefit (Building Queensland 2016). In practice, CEA is rarely applied for infrastructure projects, except for projects in very small communities (IA 2018a).

3.6.3   Multi-criteria analysis

Multi-criteria analysis (MCA) may be regarded as a scoring model, as discussed in Section 4.2. MCA differentiates and evaluates options using a set of identified assessment criteria with weights assigned to each criterion (IA 2018a). The analysis involves 'subjectively scoring each option against each criterion and calculating a weighted score' (IA 2018a, p. 82).

3.6.4 Unacceptable approaches

Other types of analysis, such as CGE modelling, can provide useful additional information. CGE modelling traces the flow-on effects of a policy change in a systematic way, such as indirect impacts on sectors of the economy (IA 2018a). Although, as IA (2018a) note, there is limited value in the modelling for infrastructure because the directly measured impacts in the infrastructure sector (e.g., time savings in transport) will capture the majority of the welfare impacts on the Australian community. They further state that CGE is unlikely to clearly differentiate marginal options due to the aggregate level of analysis. For policy changes such as 'taxes and tariffs, CGE modelling provides insights because the flow-on impacts are much higher relative to the direct impacts' (IA 2018a, pp. 83–84).

Input-output methodology (or the use of multipliers) is 'not an acceptable methodology for economic evaluations' (QT 2015b, p. 12). According to QT (2015b), analysis of individual projects based on input-output modelling does not account for the impact of alternative projects, which will also lead to increased output for a region.

3.6.5 Novel approaches and wider economic benefits

The IA assessment framework postdates the frameworks and guidance materials from DIRD and Building Queensland. Specifically, the IA (2018d) assessment framework was updated in May 2018 to provide guidance in key areas, comprising:

- *how climate change risks are treated in the economic appraisal of an infrastructure project*
- *how to capture land use impacts in the cost–benefit analysis of an infrastructure project*
- *reviewing and reporting on projects after implementation to determine if outcomes were achieved and inform future infrastructure decisions.*

IA's guidance on capturing land use impacts in the CBA of an infrastructure project represents a subtle, yet significant, shift in the approach to CBA—one not evident in the environmental impact assessment for the Sunshine Coast Airport (SCRC 2014b). The Sunshine Coast Airport expansion analysis modelling does not explicitly consider the impact of the project, or portfolio of projects, on existing property values, presenting only a reserved comment.

Consideration of land use impacts in wider economic benefits is not new, and the relationship is grounded in economic theory (IA 2018a). However, IA acknowledge infrastructure projects can have significant land use impacts that are not easily captured in conventional CBA. While they do not prescribe an approach, IA suggest proponents clearly indicate the type of approach or model used, including the name of the model, the types of behaviours it models, key inputs and assumptions, and interaction with other demand and supply models. With a quantified and fully attributed set of land use impacts, supported by evidence of dependency and conditionality, costs and benefits may be captured within a CBA framework (IA 2018a).

The opportunity for land use impacts to assist funding is widely acknowledged, with Building Queensland (2016, p. 55) asserting 'the opportunity for value capture to assist funding projects must be explored in a Building Queensland preliminary business case'.

3.7 Value capture

Agencies charged with improving and maintaining transportation networks have had to employ creative approaches to fund new infrastructure projects (RDASC 2016; Vadali 2014). According to Vadali (2014), value capture is one mechanism that helps agencies do more with less, obtain

efficiencies through new management approaches, and discover alternative funding methods to cover any funding shortfalls.

Value capture has a history in local government finance and its origins are rooted in the benefit principle of taxation (Vadali 2014). Value refers to the benefit accrued by the landowner or developer due to the infrastructure investment, and capture relates to the entity or agency capturing a portion of the gains as a way of recouping the costs of investment (Vadali 2014).

In practice, value capture is an innovative public finance method in which the increases in property or land value owing to public infrastructure improvements are captured through land-related taxes or other means to pay for such improvements (Batt 2001; Dalvi 1998; Vadali 2014). Vadali (2014) identifies 10 value capture techniques, ranging from impact fees or one-time charges, through to joint ventures and granting air rights. The techniques this research focuses on relate to land tax in:

- Land value tax (LVT)—a tax imposed on the value of land benefiting from transportation infrastructure.
- Tax increment financing (TIF)—a mechanism allocating any increase in total property tax revenues toward public investment within a designated district (Vadali 2014).

According to Chapman (2017) and Tsai et al. (2017), there is increasing interest in value capture methods that leverage land tax to finance infrastructure. Chapman (2017, p. 35) supports this assertion by noting international research such as Barbu's (2013) study, which 'assesses the implications of moving from a property tax to a land tax to finance public transit in Ontario and Toronto regions in Canada'. The natural advantage of land tax as a focus for value capture is discussed in the Henry Tax Review (Henry et al. 2010), Clark-Jones et al. (2016) and Chapman (2017). In the Henry Tax Review, land tax is identified as one of the most efficient means of raising revenue, as efficiency arises from 'the immobility of the tax base and, unlike most other taxes, levying different rates of land tax in different States has very low efficiency costs' (Henry et al. 2010). Chapman (2017, p. 32) considers the inherent social benefits of land taxation as a mechanism for funding infrastructure:

> [M]any economists now regard the land portion of the property tax as progressive, because wealthy people tend to own more land than poor people. In addition, it is also argued that the land tax is efficient because there is no economic [behaviour] that can be changed to avoid the tax.

The application of LVT and TIF approaches to funding infrastructure is not without substantial challenges. Clark-Jones et al. (2016) discuss the difficulty using evidence-based policy-making for value capture in isolating and estimating the effect infrastructure has on land values. Hedonic pricing models may assist with predicting value uplift; however, they do not observe the timing of value accrual (Clark-Jones et al. 2016).

3.7.1 Identifying the beneficiaries and benefits

There are further complications in identifying the beneficiaries and applying value uplift projections to geographic areas. In general, the further one lives from a station or port, the less they benefit from accessibility; yet, the relationship between distance to station (or port) and value uplift applies to all parcels of land. For some forms of transport infrastructure there are negative attributes, such as noise and air pollution, and an increase in crime at concentrated access points (Clark-Jones et al. 2016).

3.7.2   Estimating the value uplift

To determine the costs and benefits associated with land use impacts, the magnitude and distribution of the change must first be determined (IA 2018a). There are several models and approaches to measuring land use impacts, which can be delineated along multiple lines of separation. IA provide a range of methodological issues to consider when modelling land use impacts. They conclude the detailed technical note by saying, this is 'a new area of guidance for this framework. It is intended to outline the guiding principles and provide initial foundational guidance, which will be expanded upon in future years as part of the continuous improvement' (IA 2018a, p. 110).

According to the DIRD (2015), there are more than a hundred papers addressing value uplift. The usable observations for commercial and residential properties from these meta studies are summarised in Table 3.10.

Table 3.10: Average value uplift per transit mode

MODE	AVERAGE VALUE UPLIFT (%)	RANGE (%)	NUMBER OF OBSERVATIONS
Heavy rail	6.9	−42 to 40	18
Light rail	9.5	−19 to 30	32
Bus rapid transit	9.7	−5 to 32	17

DIRD 2015

In a detailed study by Murray (2017), the impact of the Gold Coast Light Rail (GCLR) on statutory land value increases was estimated at $300 million. The gains were primarily accrued by landowners within 400 metres of the stations, who saw their statutory land values increase by an additional 7%. The estimated value gains were equivalent to one quarter of the capital cost of Stage 1 of the GCLR (Murray 2017).

Tsai et al. (2017) acknowledge the limited research on the effect of ferry systems on land values. Their study applies geographically weighted regression to determine the property value effects of the Brisbane linear ferry system. They considered transaction prices from sales records, as opposed to statutory land assessments as used by Murray (2017).

The Tsai et al. (2017, p. 134) research findings confirm that 'property values in the study area do benefit from accessibility to ferries, especially in areas where residential redevelopment has taken place around the ferry terminals'. In keeping everything else constant, 'a one [kilometre] decrease in the distance to the CBD is expected to increase the price by 2.2 percent on average, whereas a one [kilometre] decrease in the distance to the ferry terminal is expected to increase the price by 4 percent' (Tsai et al. 2017, p.127).

Tanko and Burke (2015) and Tsai et al. (2017) confirm that property values rise with access to ferries. Unlike train stations, the value uplift does not appear to drop as you get close to the station or terminal. With the CityCat operation in Brisbane, there is evidence to suggest an 8% increase in property values within 2 kilometres of a terminal (Tanko & Burke 2015).

3.7.3   Capturing the uplift

According to Clark-Jones et al. (2016), land tax has the potential to recover a significant percentage of a project's cost while leaving a benefit for landowners. In a worked example, they found a '3–7 [percent land value uplift] around the Cross-River Rail project … could generate $33.5–$45.1 million annually' (Clark-Jones et al. 2016, p.7). By implementing their levy strategy over a 30-year

timeframe, Clark-Jones et al. (2016) demonstrate 14.5–19.5% of the total project cost could be recovered.

Murray (2017) discusses gains recapture in his analysis of the GCLR project and includes consideration of recovery through land tax and local council rates. However, he primarily advocates for 'further transit funding mechanisms through direct charges of local beneficiaries' (Murray 2017, p. 8). In supporting the argument, he estimates a relatively modest $2.5 million increase in land tax revenue for the Queensland Government.

3.7.4   Evaluation mechanisms

There are a series on mechanisms that may be employed to capture value uplift. In addition to state-based land taxes, council rating programs provide an existing taxation structure that may be adapted to meet the principles of efficiency and equity. Through pricing mechanisms, a local council rating system may follow the principles shared by Building Queensland (2016), of efficiency (economic and taxation efficiency), equity, fairness (horizontal equity), materiality and sustainability (stability and reliability).

Regardless of the mechanisms selected, it is important to remember that rising property values are not welcomed by all residents, particularly those who do not own homes (Siegfried et al. 2007). The impact 'of local taxes both paid and avoided, services provided in lieu of taxes, and changes in property values in the local area are complex and often contentious town-gown issues, and are seldom considered in impact studies.' (Siegfried et al. 2007, p. 554)

3.8   Project management

Project management is 'the application of knowledge, skills, tools, and techniques to project activities to meet the project requirements' (PMI 2017a, p. 716). A project may be managed in three separate scenarios: as a standalone project (outside a portfolio or program), within a program, or within a portfolio (PMI 2017a). There is no set standard for when a project should be managed as part of a program or portfolio. However, from an organisational perspective, PMI (2017a) see program and portfolio management as focusing on doing a program and project the right way; and portfolio managers focusing on doing the 'right' programs and projects.

Based on the PMI (2017a) delineation, the Australian assessment frameworks and guidelines are designed to enable project and program management entities to do the project the right way. For example, DIRD (2018a) have published the ATAP guidelines to provide a comprehensive framework for planning, assessing and developing transport systems and related initiatives. They refer to their framework as an activity and decision-support system, with a logical, multi-step approach aimed at achieving the high-level goals and transport system objectives of a jurisdiction (DIRD 2018a). The framework has seven parts or stages leading from goals and objectives through to delivery and post completion review, as illustrated in Figure 3.1.

Figure 3.1: Australian Transport Assessment and Planning Framework
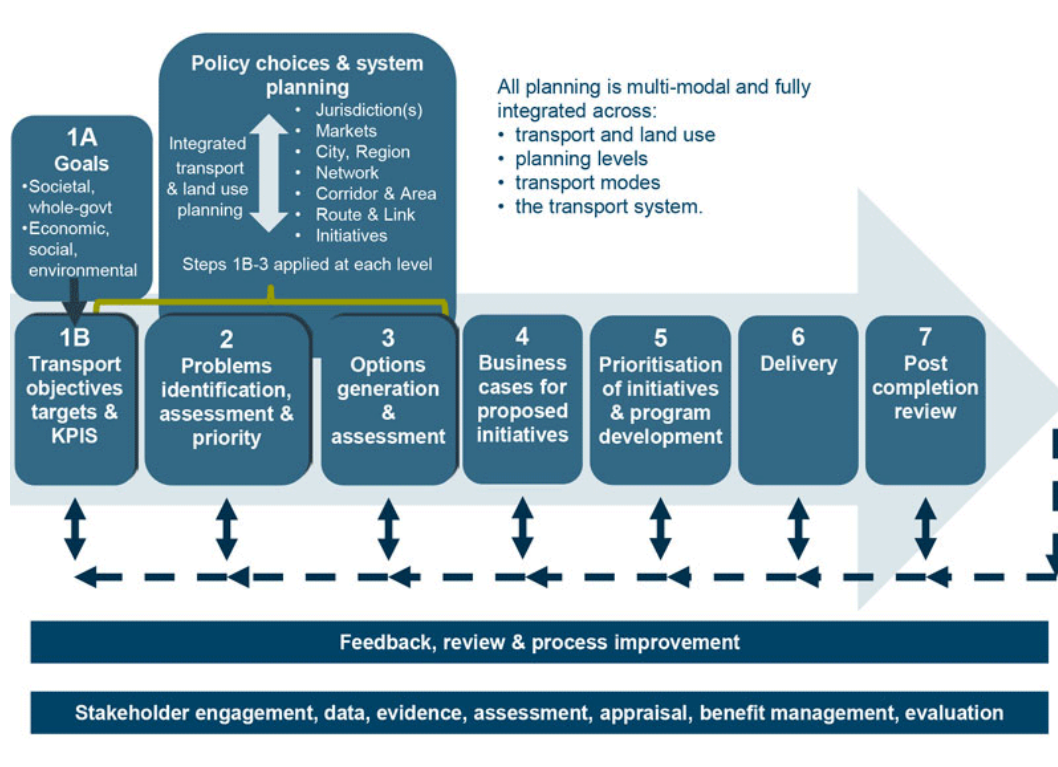
DIRD (2018b) note that the framework is to be applied in the complex environment of government decision-making, which involves competing objectives, trade-offs, constraints, uncertainty, multiple options, and quantifiable as well as unquantifiable impacts. Specifically, they refer to the process not being strictly sequential with steps overlapping, observing that 'activities in some steps [occurring] more than once following feedback from other steps … and there is no single start or end point'. (DIRD 2018b, p.10). However, the framework has been designed to 'reduce complexity, [add] objectivity, consistency, rigor and transparency.' (DIRD 2018b, p.10). It is predictive by nature, taking advantage of the known and proven. PMI (2017b) characterise a predictive lifecycle with reduced uncertainty and complexity, allowing for the segmentation of work into sequences or predicable groupings. As such, the framework is not designed to encourage agile projects (those requiring iterative processes to clarify the scope, see Section 3.2).

The ATAP Framework is said to align with the IA's Reform and Investment Framework. IA (2018a, p. 6) frame the alignment as 'for transport, [IA] generally supports the use of the [ATAP] guidelines'. There are variations between the ATAP and IA materials, and they may be attributed to purpose and timing.

The IA assessment framework is the mechanism used to consider infrastructure initiatives and projects for inclusion on the Infrastructure Priority List (IPL) (IA 2018d) (see Section 3.2, Table 3.3). The framework is applied to a range of projects, not only transport, and focuses on business case development and assessment to assist with list prioritisation. Specifically, they provide checklists for business case development and assessment, and a template for business case assessment (IA 2018d). The IA framework considers project relationships and alignments, allowing multiple projects in a single business case. To assist in determining project relationships, IA have prepared definitions of relationships (see Table 3.11).

Table 3.11: Infrastructure Australia project relationships

PROJECT RELATIONSHIP	DEFINITION
Substitutes	The net benefits of undertaking both Project A and Project B are lower than the net benefit of undertaking Project A by itself, plus the net benefit of undertaking Project B by itself. For example, Project A has a net benefit of $100m and Project B $200m if undertaken alone. The net benefit if both are undertaken is $250m.
Complements	The net benefits of undertaking both Project A and Project B are higher than the net benefit of undertaking Project A by itself, plus the net benefit of undertaking Project B by itself. For example, Project A has a net benefit of $100m and Project B $200m if undertaken alone. The net benefit if both are undertaken is $400m.
Independent	The net benefits of undertaking both Project A and Project B are equal to the net benefit of undertaking Project A by itself, plus the net benefit of undertaking Project B by itself. For example, Project A has a net benefit of $100m and Project B $200m if undertaken alone. The net benefit if both are undertaken is $300m.

Source: IA (2018a)

It is unclear from the IA priority list, which (if any) initiatives or 'projects' are assessed as a portfolio in a single business case.

The ATAP and IA frameworks and guidance may assist public and private sector project proponents refine their initiatives, but they do not necessarily encourage state and local governments to manage a suite of projects as portfolios to achieve organisational objectives. The frameworks discuss portfolio relationships and connection to regional strategic objectives; yet, they assess projects in isolation rather than according to the project's influence on the portfolio of regional projects, both underway and proposed.

3.9   Portfolio management

Portfolio management is 'the centralised management of one or more portfolios to achieve strategic objectives. The programs or projects of the portfolio may not be interdependent or directly related.' (PMI 2017a, p. 15). Portfolio management seeks to align portfolios with organisational strategies by selecting the right programs or projects, prioritising the work and providing the needed resources. According to PMI (2017a, p. 15), the aim of portfolio management is to:

- *guide organisational investment decisions*
- *select to optimal mix of programs and projects to meet strategic objectives*
- *provide decision-making transparency*
- *prioritise team and physical resource allocation*
- *increase the likelihood of realising the desired return on investment*
- *centralise the management of the aggregate risk profile allocations.*

Maximising the value of the portfolio requires careful examination of its components. Components are prioritised, so those contributing most to the organisation's strategic objectives have the required financial, team and physical resources (PMI 2017a, p. 15).

As discussed in Section 3.1, within portfolios or programs, projects are a means of achieving organisational goals and objectives. In practice, this is often accomplished in the context of a strategic plan, which is the primary factor guiding investments in projects. Alignment with an organisation's strategic goals can be achieved through the systematic management of portfolios, programs and projects through the application of organisational program management (PMI 2017a). The PMI (2017a) define organisational program management as a framework in which portfolio,

program and project management are integrated with organisational enablers to achieve strategic objectives. The framework is illustrated in Figure 3.2.

Figure 3.2: PMI organisational program management

Organizational Environment

Portfolio Review and Adjustments

Strategy → Portfolio: Value Decisions → Programs and Projects: Results Delivery → Operations: Business Value Realization

Business Impact Analysis

Value Performance Analysis
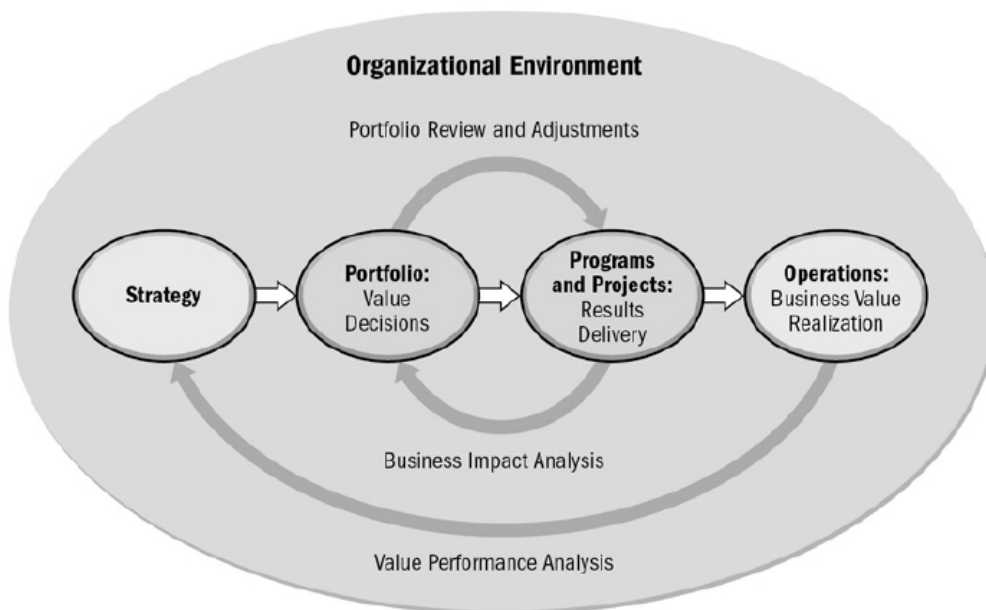
Source: PMI (2017a)

The purpose of organisational program management is to ensure the organisation undertakes the right projects and allocates critical resources appropriately. Organisational program management seeks to 'ensure that all levels in the organisation understand the strategic vision, the initiatives that support the vision, the objectives, and the deliverables' (PMI 2017a).

There may be clear benefits in the application of organisational program management to facilitate the delivery of priority projects, programs and portfolios. However, projects of regional significance inherently span various levels of government and attract a broad range of stakeholders and sponsors (see Section 3.1). For this reason, there are entities and business units specially tasked with facilitating or navigating different levels of approvals, such as the federal Major Projects Facilitation Agency (MPFA), which is responsible for providing 'a single entry point for major project proponents seeking tailored information and facilitation of their regulatory approval requirements' (DIIS 2018). The agency is charged with facilitating the approvals process for major projects, which it does by:

- *providing information on Australian Government regulations and approvals*
- *mapping critical approvals pathways and processes for major investment projects above $20 million, in consultation with regulators and government agencies*
- *facilitating communication between regulators and project proponents*
- *monitoring approvals milestones for projects, and addressing any issues with the process* (DIIS 2018).

While the MPFA is specifically designed to streamline the process, it does not provide a portfolio management role. It does not accommodate the centralised management of one or more portfolios to achieve strategic objectives, as discussed in the PMI (2017a).

Regional Development Australia (RDA) is another government initiative created to support the development of regional areas. As a national network of committees, RDA 'work in consultation with

the community, business, not-for-profit organisations and all levels of government, to articulate local priorities, identify and align resources, engage stakeholders and promote solutions' (RDASC 2018). In their strategic planning document, the *Regional Road Map*, the RDASC (2017, p. 5) define their role as being to 'support, lead, advocate, participate, facilitate, and encourage delivery of region building projects'. In this role, they identify key stakeholders in regional priorities related to economic development, infrastructure and innovation (see Table 3.12).

Table 3.12: RDASC regional projects, government priorities and stakeholders

REGIONAL PRIORITY	SPECIFIC PRIORITY	PROJECT/ACTIVITY	KEY STAKEHOLDERS
Economic development	Digital capacity and skills building	Digital Scorecard Program	DSITI Sunshine Coast Council Noosa Council
Economic development	Regional economic development strategies	Mobilise Youth—Learner Driver Mentor Program	Community Solutions IFYS United Synergies
Economic development	Regional economic development strategies	The Ripple Effect	Sunshine Coast Business Collaborative Sunshine Coast Collaborative Sunshine Coast Chamber Alliance
Infrastructure	Digital infrastructure	Speed it Up Broadband Infrastructure Advocacy Campaign Coast International Submarine Broadband Cable	Sunshine Coast Council Noosa Council DSITI Chamber of Commerce Alliance Digital Sunshine Coast
Infrastructure	Transport infrastructure	North Coast Rail Upgrade, Bruce Highway Upgrade, Sunshine Coast Airport Expansion, National Freight Corridor, Integrated Transport Infrastructure Planning, influencing modal shift and commuter behaviour to alternate, smart solutions	Sunshine Coast Business Council DTMR Sunshine Coast Council Noosa Council Federal, State, and Local MPs Sunshine Coast industry Infrastructure Australia
Innovation	Entrepreneurship capacity building	Entrepreneurial Ecosystem Start-up Business High School Curriculum Coding & Programming Curriculum	The Innovation Centre SPARK Bureau Noosa Boardroom TAFE QLD East Coast Mountain Creek State High School DET Sunshine Coast Council Noosa Council Silicon Coast
Innovation	Innovation	Advancing Regional Innovation Program	DSITI Sunshine Coast Council Noosa Council Industry DSC USC

Source: RDSC (2017)

After excluding education institutions, individuals, stakeholders that have single project interests or a role that does not extend to regional economic development, the stakeholder list reduces to nine. The purpose and roles of the nine key stakeholders are outlined in Table 3.13.

Table 3.13: RDASC Regional projects stakeholders

STAKEHOLDER GROUP	KEY STAKEHOLDERS	BRIEF PURPOSE AND ROLES
Australian Government departments and related entities	Infrastructure Australia	'[A]n independent statutory body with a mandate to prioritise and progress nationally significant infrastructure' (IA 2018d).
Queensland Government departments and related entities	Department of Innovation, Tourism, Industry Development and the Commonwealth Games (previously DSITI)	'[T]o further the Advance Queensland agenda and to develop the strategies and capabilities to deliver the Queensland Government's objectives: creating jobs and a diverse economy; delivering quality frontline services; protecting the environment; and building safe, caring and connected communities' (DITID 2018).
Local government departments and related entities	Sunshine Coast Council	'[T]o deliver a range of plans and strategies that guide the delivery of major projects across the region and councils works program … committed to … be Australia's most sustainable region—healthy, smart, creative' (SCRC 2018d).
Local government departments and related entities	Noosa Council	'[T]o deliver an economically, environmentally and socially sustainable Noosa' (Noosa Council 2018).
Regional business association	Sunshine Coast Business Council	'[T]o be a leading regional advocate for business and for the economy. Our purpose is to work cooperatively with industry and government to maximise regional economic performance by stimulating thought leadership and discussion around economic growth, infrastructure, investment and employment' (SCBC 2018).
Regional business association	[Sunshine Coast] Chamber of Commerce Alliance	'[A] central information hub for local businesses, those doing business and investors to the region' and ' … to represent the interests of business in key planning conversations' (SCCA 2018).
	SCRIPT	'Advance Queensland Regional Innovation funding was collectively matched by a number of Sunshine Coast organisations providing over $1 million over 3 years to develop innovation and entrepreneurial activities across the Sunshine Coast region: "Our vision is to fuel the culture of innovation on the Sunshine Coast; our purpose is to invest in innovative programs that make a difference to our community"' (Digital Sunshine Coast 2018).
	Digital Sunshine Coast	'[A] collaborative project hosted by Regional Development Australia Sunshine Coast, Sunshine Coast Council, Noosa Council, Silicon Coast, and SCRIPT—in partnership with a large network of organisations and individuals' (Digital Sunshine Coast 2018).
	Silicon Coast	'[I]s an online community that tries to mimic an innovative culture akin to Silicon Valley—a place of passion, innovation, creativity and collaboration: "Silicon Coast develops, supports, and stewards a vibrant ecosystem that maximises creativity, collaboration, sharing and innovation"' (Digital Sunshine Coast 2018).

Sources: Digital Sunshine Coast (2018), IA (2018d), DITID (2018), Noosa Council (2018), SCBC (2018), SCCA (2018), SCRC (2018d)

The stakeholders identified in Table 3.13 have an interest in the development of the Sunshine Coast region. They may even have an implied intent to support the transformation of 'the Sunshine Coast economy and its employment base, and [generate] an array of associated investment opportunities' (SCRC 2018d, p. 19). In particular, the Sunshine Coast and Noosa Councils have established departments and/or work areas focused on economic development (Noosa Council 2018; SCRC 2018d). The regional business associations, Sunshine Coast Chamber Alliance and Sunshine Coast Business Council, support region wide economic development, sponsoring research projects and events targeted at realising the benefits of regional projects and programs. However, they are not designed, equipped or resourced to manage projects as a portfolio or within organisational program management as discussed in PMI (2017a).

4   FRAMEWORK DESIGN

4.1   Categorising projects

Examination of past research findings and publications from all levels of government reveals an absence of an agreed system of project classification. Kloppenborg et al. (2019) propose four ways to classify projects that may assist project managers establish an internal classification system. Yet, the system does not suit the quantification or classification of projects with regional, state or national significance in Australia. The frameworks and criteria prescribed by federal and state governments assists in measuring project scale, but the thresholds and terminology are not universally adopted. This results in confusion over what is a project and what is an operation.

The review does provide some clear threads that are applicable to designing a new project classification system. They include considerations of what constitutes a project and how impact or influence can be categorised:

> **Project**: whether the project is a project or an operation with a notionally set funding window. Similarly, there may be initiatives that should be classified as an activity inherent in the ongoing management of a facility or asset.

> **Impact**: impact and influence are considered in three main categories. First, the prescribed or adopted intent of the project and how it may contribute to transform the region's economy and its employment base, generating an array of associated investment opportunities (SCRC 2018a); second, investment in terms of dollars spent or the project cost (DIIS 2018; QT 2018b; RDASC 2018); and third, sustained employment (RDASC 2018; SCRC 2018).

4.2   Categorisation rubric

Assessment frameworks and quantified thresholds have been identified in the review (Section 3). The frameworks can be substantial documents detailing a formal pathway through preliminary evaluations, such as the Queensland Government's PAF (QT 2018b). Quantified thresholds are depicted in a range of documents detailing criteria such as those used by the Australian Government in the application for a major project (DIIS 2018). While they serve an internal purpose and may help an applicant self-assess the quantifiable parts of their application, they are complicated to navigate. Further, they may be too rigid to accommodate dynamic projects such as those impacted by disruptive technologies or those requiring a flexible scope due to high-uncertainty work (PMI 2017b). Conversely, scoring models or matrices and rubrics more easily articulate expectations.

Scoring models are generally applied in project selection rather than project categorisation. As a form of non-monetary valuation, scoring models and MCA can be misleading, 'because the criteria … involve different scales, the resulting index can only be used as an ordinal ranking' (IA 2018a, p. 86). Thus, the approach has limited value in assessing viability, as scores are not comparable in terms of scale and magnitude of scope and service levels. Notwithstanding the limitations, MCA is considered an acceptable technique for evaluating infrastructure project options (IA 2018a). IA (2018a, p. 87) caution using this method as a project comparison tool, noting 'the analysis is questionable due to the subjectivity and lack of transparency around conversion, scores and weights'.

Conversely, rubrics, or narrated scoring matrices, have been applied in a series of industries to articulate expectations and assess performance. Assessments rubrics are utilised in education to convey expectations for an academic assessment (Andrade 2000; Arter & Chappuis 2007, cited in Reddy & Andrade 2010; Stiggins 2001), and provide more reliable benchmarks for comparison (Biggs

& Tang 2009). They have the added benefit of clearly depicting criteria satisfaction levels and, as a result, can be designed to accommodates a greater diversity of projects than quantified thresholds.

Across disciplines, there are various forms of rubrics, including those designed specifically for assessing project management students and designed artefacts (Boyd 2015). For this research, a rubric has been designed to assist the classification of regionally significant projects. The rubric is purpose-built rather than adapted from a previous study, and is informed by the findings of the review into project classifications.

In the absence of published research support or comparable investigatory findings, industry and expert knowledge has been applied to populate the body of the regional significance project rubric (see Table 4.1). As such, the assessment areas that form the framework for the rubric are supported by published research and the previous findings of this research project. Notably, wording associated with the gradations are novel and without an empirically defendable level of support. As such, the rubric will require tuning in the subsequent evaluation research project.

4.3 Rubric application

By design, the rubric has a scoring component with the project (P) and impact (I) treated separately. The project score is a categorical multiplier code. If the initiative is a portfolio or project, it will score a positive one (+1); a process or 'ongoing operation' will score a negative one (−1). Both management and activities have zero multipliers. Thus, a positive score will reflect projects and portfolios of regional significance, while a negative score implies the initiative has significance but should not be classified as a project. It could necessitate consideration as a regionally significant process or operation and be referred for alternative consideration in the respective management entities. Management and individual activities have zero scores, implying they are not regionally significant projects or operations; rather, they are the responsibility of management organisations such as the facilities management division or department of a local council.

The impact score is assessed in a comparable manner to a scoring matrix, with criteria weighting multiplied by the score. The result scores are then summed. For example, if project Alpha is said to have 'potential to improve the region's economy and/or its employment base', then it would be attributed a score for I1 of 12.5 (0.25 x 50). If the same project has an estimated investment of $10 million to $50 million and estimated ongoing full-time equivalent (FTE) jobs less than 20, then it will score 6.25 (0.25 x 25) for I2 and 0.00 (0.00 x 25) for I3. The total (summated) score for project Alpha would be 18.75 out of a potential 100.

As previously noted, the rubric will require some refinement through evaluation. However, a hurdle score could be provisionally set to categorise a project or portfolio, so the onus is on the term 'categorise', as the rubric is not a valuation tool and does not assess project financial feasibility. The set categorisations are:

- high priority regional project or portfolio
- priority regional project or portfolio
- not a priority project or portfolio.

The suggested relationship between significance score and project categorisation is presented in Table 4.2. The further potential to tune the rubric is discussed in Section 5.

Table 4.1: Regional significance project rubric

PROJECT (P)	CRITERIA	PORTFOLIO [+1]	PROJECT [+1]	PROCESS [−1]	MANAGEMENT [0]	ACTIVITY [0]
	Nature of initiative (P)	Projects, programs, subsidiary portfolios and operations managed as a group to achieve strategic objectives	Temporary endeavour[s] undertaken to create a unique product, service or result	Systematic series of activities directed towards improving a product, service or result	Systematic series of activities directed towards maintaining a product, service or result	A distinct, scheduled portion of work performed during a project
IMPACT (I)	CRITERIA	HIGH PRIORITY [1.00]	PRIORITY (Fairly important) [0.75]	IMPORTANT [0.50]	SLIGHTLY IMPORTANT [0.25]	NOT AT ALL IMPORTANT [0.00]
	Prescribed or adopted **intent** to transform the region's economy (I1) [50]	Potential to transform the region's economy and its employment base, generating an array of associated investment opportunities	Potential to materially improve the region's economy and its employment base, generating associated investment opportunities	Potential to improve the region's economy and its employment base, generating associated investment opportunities	Potential to improve the region's economy and/or its employment base	No potential to materially improve the region's economy or its employment base
	Initial capital **investment** (I2) [25]	Estimated investment exceeds A\$250 million (1.61% of GRP[1])	Estimated investment of A\$100 million (0.65% of GRP[1]) to A\$250 million	Estimated investment of A\$50 million (0.32% GRP[1]) to A\$100 million	Estimated investment of A\$10 million (0.06% GRP[1]) to A\$50 million	Estimated investment less than A\$10 million
	Sustained new **employment** (I3) [25]	Estimated ongoing FTE jobs exceeds 2000 (0.58% of EP[2])	Estimated ongoing FTE jobs of 1000 (0.29% of EP[2]) to 2000	Estimated ongoing FTE jobs of 200 (0.06% of EP[2]) to 1000	Estimated ongoing FTE jobs of 20 (0.01% of EP[2]) to 200	Estimated ongoing FTE jobs less than 20

1 The Sunshine Coast and Noosa region GRP of approximately \$15.5 billion per annum (NIEIR 2016 in RDASC 2017, p. 5).

2 The Sunshine Coast and Noosa region estimated population 347,012 (OGSO 2017 in RDASC 2017, p. 11).

Table 4.2: Project categorisation

SCORE	CATEGORISATION
>80	High priority regional project or portfolio
65-80	Priority regional project or portfolio
<15-64	Not a priority project or portfolio

4.4 Measuring the financial and economic impact

From private and government sector perspectives, the results of financial and economic analyses have a significant effect on the ultimate determination of a project's priority and selection. Financial analysis focusing on cash flows may be applied at various levels from a single project to an organisation. However, in the public sector, financial analysis is normally undertaken by a government department or agency, or a government-owned corporation (Building Queensland 2016).

The focus on a single government department or agency, or a government-owned corporation, potentially limits the DCF analysis. By specifically excluding taxation from the financial analysis, there is limited capacity to model the impact a project may have on other departments or government organisations. As discussed in Section 3.8, the land value uplift from a project may lead to a greater revenue through land tax. This cannot be captured in the current approach to public sector financial analysis; however, land use impact may be modelled, in part, through economic analysis.

Economic analysis builds on a financial analysis with the addition of other impacts and benefits not directly captured or incurred by the sponsor. Given the broad scope, there is some conjecture as to whether the errors in economic impact modelling stem from misunderstanding or deliberate misrepresentation. As such, a series of frameworks are applied in the public sector to guide investment decision-making. These frameworks advocate the use of CBA—a form of DCF analysis—as the primary method of economic evaluation of public sector policies and projects (Building Queensland 2018; IA 2018a; DIRD 2018a; QT 2015b).

Previous research has found that value capture presents a theoretically sound approach to fund infrastructure projects in Australia. The consideration of land use changes in a financial analysis and economic evaluations in CBA is a developing field of analysis. While barriers to the analysis exist, there are practical models worth testing. For example, Walk Score (2018) and other models that assess the walkable nature of a residential address may be incorporated into the analysis. Walk Score measures the ease of walking or catching public transport from an assessed address to points of interests and central business areas. The score has been used to analyse light rail station area performance for local governments, and is the focus of studies designed to predict house prices based on walkability (Cortright 2009; Walk Score 2018). Such a toll is used to assess a walk or travel score before and after a proposed transport intervention, with the results considered in the financial and economic analyses.

4.5 Managing projects and portfolios

With the aim to strengthen and build regional communities, the RDASC is potentially best placed to assist in managing priority regional projects and portfolios. The role of the RDA has evolved. In 2017 it was set to 'support, lead, advocate, participate, facilitate, and encourage delivery of region building projects' (RDA 2017, p. 5). The current role is more focused on facilitation through building partnerships; specifically, 'increasing the capacity of the region to meet the needs of its members' is the fifth key role of the RDASC. Thus, RDASC (2018) will:

1. *Promote economic and employment growth and contribute to business development and investment attraction.*
2. *Help broaden the region's industry base and develop new products or markets, including export markets. Job creation and economic sustainability will be outcomes of this work.*
3. *Support social inclusion programs for disadvantaged groups, facilitate social interaction, provide financial support, improve housing conditions, access to services and education, help unemployed people find jobs; help 'close the gap' for Indigenous Australians.*

4. *Another economic development focus should be sustainability; [e.g.] identifying environmental and climate change issues, identifying linkages between existing Australian and state and territory government programs and initiatives, and developing strategies to bring together competing interests in the context of scarce resources* (RDASC 2018).

As a not-for-profit community-based organisation led by volunteers, the reach and span of RDASC is limited. The committee and network are not resourced to provide the portfolio management or OPM roles discussed earlier in Section 3.10. As such, an alternative project or organisational structure is required to support delivery of a suite of regionally significant projects in an environment disrupted by technology and demands from stakeholders for immediate delivery of value.

4.5.1   Agile

Traditional predictive approaches to project management are well entrenched in the PMBOK (PMI 2017a), as well as the frameworks and guidelines established to prioritise and oversee infrastructure projects (see Section 3.10). For defined projects with reduced uncertainty, teams may segment work into a sequence of predictive groupings (PMI 2017b), well suited to the application of the reviewed frameworks and traditional approaches to project management.

Facilitating or supporting the delivery of a suite of regionally significant projects comes with high-uncertainty, high rates of change, complexity and risk. As such, they present problems for more traditional predictive approaches that aim to determine the bulk of requirements upfront, and control changes through change request processes (PMI 2017b).

Agile techniques and approaches are designed to effectively manage disruptive technologies and high-uncertainty work (PMI 2017b). According to PMI (2017b), an agile project team expect requirements to change. The iterative and incremental nature provides feedback to better plan the next part of the project and, when teams use agile approaches, the incremental delivery uncovers hidden or misunderstood requirements. The characteristics of predictive, iterative, incremental and agile lifecycles are depicted in Table 4.3.

Table 4.3: PMI characteristics of four categories of lifecycles

APPROACH	REQUIREMENTS	ACTIVITY	DELIVERY	GOAL
Predictive	Fixed	Performed once for the entire project	Single delivery	Manage cost
Iterative	Dynamic	Repeated until correct	Single delivery	Correctness of solution
Incremental	Dynamic	Performed once or a given increment	Frequent smaller deliveries	Speed
Agile	Dynamic	Repeat until correct	Frequent small deliveries	Customer value via frequent deliveries and feedback

Source: PMI (2017b)

The customer value goal supported by an agile approach is well aligned to the role of a portfolio manager (see Section 3.10) or even facilitator, such as RDASC. However, the goal is rather ambiguous and not defined in a way that supports predicative approaches to project management. The delivery of frequent small packages or items and focus on customer value may complement a regionally significant regional project. For example, SunCentral Maroochydore is a traditional council-owned company with a board of directors. It has an inherently strong governance structure

and incremental process driving its role to oversee the design and delivery of a new city centre. Such a structure can assist with the management of contracts and the primary deliverable—a new city centre—within a set cost restraint. While this may technically be a form of customer value delivery, it is unlikely to satisfy the broad expectations of the diverse customer base; that is, ratepayers of the Sunshine Coast region. To realise immediate value to the ratepayer, an agile team would focus on short-term activities with a high perceived customer value impact.

4.6   Framework artefact

The design narrative and framework are considered two deliverable parts of this research. The first is this report and narrative of the framework design. The report provides the reasoning behind the design of the framework artefact. As such, it is the primary resource for refining the artefact. Further, the design method can be applied to future evaluation framework designs.

The second part is the framework artefact, presented as a dynamic template. The template is built in Microsoft Excel. Microsoft Excel is a 'software program produced by Microsoft that allows users to organize, format and calculate data with formulas using a spreadsheet system' (Technopedia 2018). Recent advances in spreadsheet modelling and sharing support the use of spreadsheets to house a framework to categorise, measure and deliver projects of significance to the Sunshine Coast region.

The evaluation framework comprises four main sheets relating to the scope of this research. The first is the categorisation rubric, which is designed to assist categorising projects. If a project is deemed to be a priority or high priority, it progresses to financial, economic and portfolio analysis.

Two additional sheets provide a template for financial and economic analysis, demonstrating the functionality promoted in the framework design. The financial and economic analysis sheets contain monthly DCF models with effective calculations of net present value. There is capacity for the sheets to be linked, providing scope for the economic analysis to build on the investment analysis. Both DCFs have the capacity to include land use impacts, as discussed in the previous sections.

A final primary sheet is prepared for an initial portfolio analysis. This mainly focuses on investment spend and timing, and can be linked to previous financial analysis modelling, or other spreadsheets depicting the quantum and timing of project investment. By modelling the forecast investment in a cashflow, the impact of a single project or suite of projects on the portfolio of priority and high priority regional projects, may be analysed. Periods of minimum and maximum expenditure can be visually presented in graphs (see Figure 4.1), or quantitatively analysed by running a simple coefficient or variation study with and without the new project or proposal. By keeping this analysis up-to-date, key stakeholders can portfolio manage or facilitate the suite of priority and high priority regional projects.

Additional sheets in the spreadsheet relate to introducing the model and disclosing information sources. A printed version of the evaluation framework is contained in Appendices A–D.

Figure 4.1: Priority project cash flow
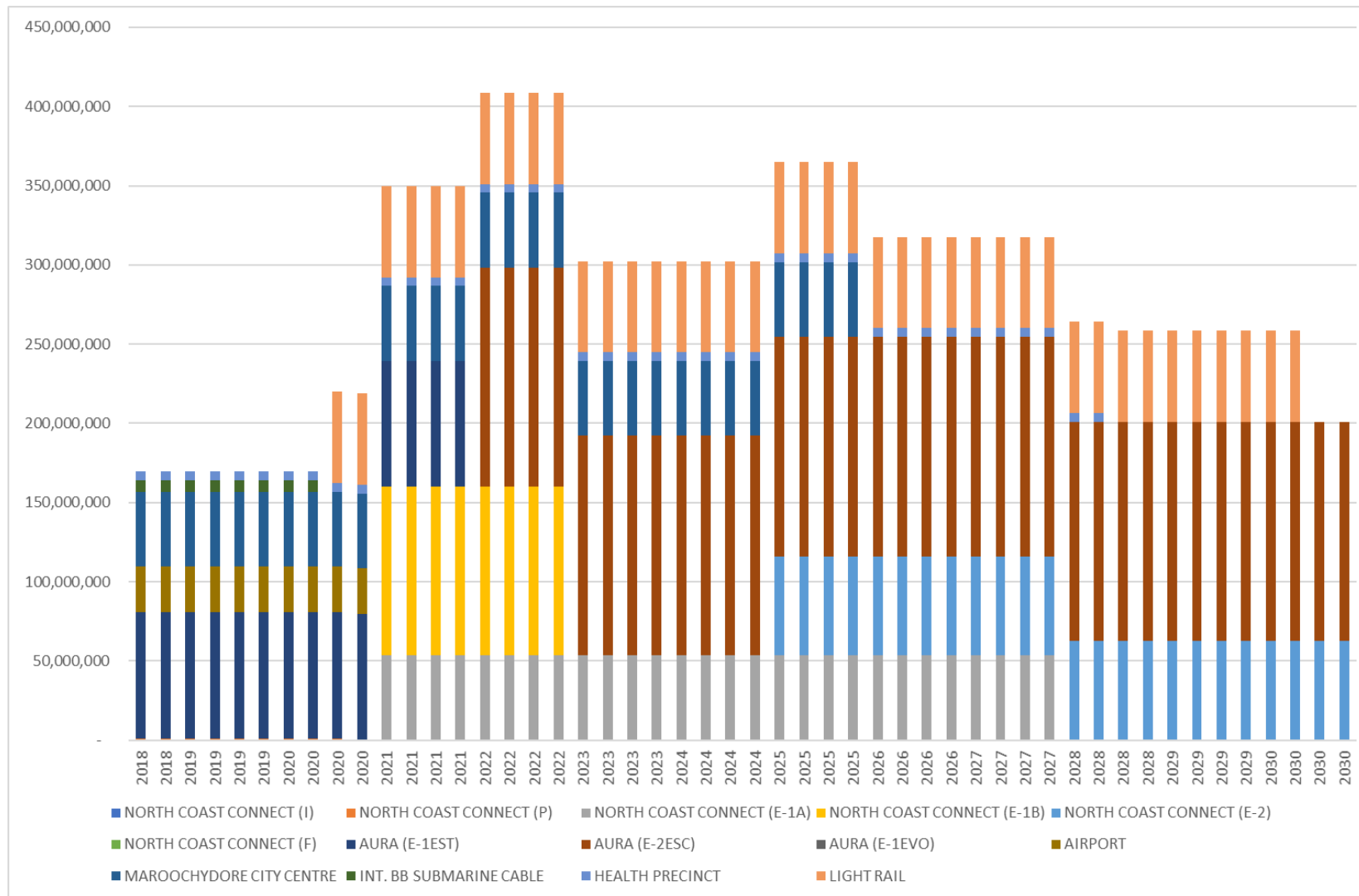
5   EVALUATING THE CATEGORISATION RUBRIC

The categorisation rubric has been applied to a selection of regional projects considered as either catalytic or game changer (see Section 3.2). Here, the researcher has applied the rubric. To deliver the envisaged benefits, the rubric should be applied by a broad range of stakeholders. Ultimately, persons with an interest in a project should have access to the rubric, undertake their own investigations, source information to answer the four questions, and observe the resultant priority categorisation.

The list of projects applied in the evaluation include the Sunshine Coast light rail project, an initiative of the SCRC (2012). The Sunshine Coast health precinct, or campus, has advanced further than the others with the completion of two operating hospitals. The submarine cable and two rail projects are in the initial stages of their respective project lifecycles.

5.1   Sunshine Coast health precinct

The Sunshine Coast health precinct, or campus, is said to underpin the growth and investment of the Sunshine Coasts health and wellbeing industry (SCRC 2014b). The investment is to 'provide a major stimulant for growth and development of the Health and Wellbeing industry on the Sunshine Coast over the course of the next 20 years' (SCRC 2104a, p. 3). The purpose aligns with the categorisation rubric's second highest priority rank of '[potentially] materially [improving] the region's economy and its employment base, generating associated investment opportunities' (see Table 5.2).

The precinct incorporates the $1.8 billion Sunshine Coast University Hospital, $60.8 million Sunshine Coast Health Institute and a $150 million private hospital (SCRC 2018a). The Sunshine Coast University Hospital is the first new tertiary hospital development in Australia for more than 25 years (SCRC 2018a). Accordingly, the health precinct is regarded as a project that fits the PMI (2017a) definition. The investment, set at more than $2 billion, would see the project meet the rubric's highest criteria for initial capital investment.

As the health precinct was developing, the SCRC projected a series of aspirational targets for the region's health and wellbeing industry. The targets include an employment progression from 18,981 in 2014 to 24,387 in 2018. While the employment target relates to the heath sector rather than the precinct or campus, it would still meet the highest criteria for the regional priority categorisation in the rubric. The full suite of aspirational targets is detailed in Table 5.1.

Table 5.1: SCRC Aspirational targets for the health and wellbeing industry

GOALS FOR THE HEALTH AND WELLBEING INDUSTRY	POSITION IN 2014	PLAN FOR 2018
Gross Value-Add	$2,038 million	$2,636.5 million
Employment	18,981 employees	24,387 employees
Exports	$484.7 million	$622.0 million
Change in Exports	NA	+28.3%
Average Annual Income	$53,187	$60,561
Change in Registered Businesses	NA	+21.5%

Source: SCRC 2014a

The Sunshine Coast Council's 2018 investment prospectus identifies the health sector as the region's largest employer, providing an estimated 20,170 jobs (NIEIR 2017, in SCRC 2018a). Further, there are almost 2,000 healthcare related businesses registered on the Sunshine Coast (ABS 2018, in SCRC 2018a). The council's jobs estimate is some 4,217 (17%) short of their prescribed aspirational target,

although the industry might have been progressed from 2017 to 2018. Continuing the trend to 2018 would present an estimated employment of 20,600 or 1,619 new jobs.

As demonstrated in Table 5.2, the regional priority categorisation rubric would provide the Sunshine Coast health precinct with a project status. The criteria would lead to allocations of 0.75, 1.00 and 1.00 for intent, investment and employment respectively. As applied in Table 5.3, the project would present a rubric score of 87.5, which would lead to the classification of high priority regional project.

Notably, the 'high' project status may be at threat if the economic intent softened and projected employment was revised down.

5.2 Priority projects

Following the same process, the Sunshine Coast Airport expansion would be allocated high priority status; although, a reduction in employment could see the project allocated a lower priority categorisation.

Due to the projected initial capital investment and sustained new employment, Aura would be categorised as a priority project. The international broadband submarine cable would share the status of a priority project due to the prescribed or adopted intent to transform the region's economy. The status of the submarine cable project would require re-evaluation when the scope is refined.

The light rail project reaches priority status in the rubric. This can be attributed to the project's proposed influence on land use and planning. While the associated documentation discusses creating economic growth, it is unclear how the proposed system provides economic efficiencies or encourage passengers to shift transport modes. With the proposed pathway principally following the existing road network, there may be few beyond those achieved in a redesigned bus network, even with priority traffic signalling. However, the introduction of a light rail and supporting integrated transport network are justification for a more compact and sustainable settlement pattern, and the increasing land use intensity is expected to result in a property value uplift (Arup 2013). Further, there are social and environmental benefits outside the scope of this research that could justify pursuing a project of this nature regardless of the economically focused criteria in the categorisation rubric.

The Maroochydore city centre and North Coast Connect rail were missing information regarding employment numbers. There are ways to overcome missing projections in the categorisation rubric: through a scenario or 'work back', it may be determined that the Maroochydore city centre and North Coast Connect rail projects would need to sustain 1,000 or more new ongoing FTE positions to gain high priority status.

Table 5.2: Regional priority categorisation rubric input

PROJECT	HEALTH PRECINCT	AIRPORT EXPANSION PROJECT	AURA MASTER PLANNED COMMUNITY	MAROOCHYDORE CITY CENTRE/THE BRIGHT CITY	INTERNATIONAL BROADBAND SUBMARINE CABLE	LIGHT RAIL	NORTH COAST CONNECT
Nature of initiative	First new tertiary hospital development in Australia in more than 25 years **PROJECT +1**	Develop a new, fully compliant runway **PROJECT +1**	Australia's largest single ownership master planned community **PROJECT +1**	Greenfield Central Business District **PROJECT +1**	Landing a new International Broadband Submarine Cable **PROJECT +1**	New rapid transit system **PROJECT +1**	Providing a new passenger rail service between Beerwah and Maroochydore. **PROJECT +1**
Prescribed or adopted intent to transform the region's economy	The investment is said to provide a major stimulant for growth and development of the Health and Wellbeing industry on the Sunshine Coast over the course of the next 20 years. **0.75**	Stimulation of diversification in employment opportunities. And to provide a platform to attract new airlines and new services. **0.75**	Australia's most prosperous and connected master planned community **0.5**	New city centre has been designed for the 21st Century. To have a transformative impact on the region's economy **0.75**	To be a 'catalyst for technology businesses' stimulating the economy making companies more likely to relocate, grow and/or invest in a region. **1.00**	To be 'catalytic and capable of creating economic growth'. **0.75**	To have a 'transformative effect' relating to reducing travel time to under 45 minutes for Sunshine Coast passengers, shaving nearly an hour off their journey. **0.75**
Initial capital investment	$2 billion **1.00**	A$347 million (2020) **1.00**	A$11 billion **1.00**	A$20.7 million to date (at 2016/17) **1.00**	A$51-68 million **0.50**	A$2.0–2.6 billion **1.00**	A$4.24 billion (2025-2030) **1.00**
Sustained new employment	5,406 (Regional health sector) **1.00**	1,538 (FTE direct 2040) **0.75**	20,000 direct **1.00**	Not available.	864 Employment (FTEs p.a., for Sunshine Coast) **0.50**	210 **0.50**	Not available. Business case being undertaken.
Information source	SCRC 2014b SCRC 2018a	SCRC 2014b	URBIS 2017	SunCentral 2017 SunCentral 2018	GQI Consulting 2017 SCRC 2018a	SCRC 2012	Stockland, SMEC, Urbis and KPMG 2017

Table 5.3: Regional priority categorisation workings and output

PROJECT	HEALTH PRECINCT	AIRPORT	AURA	CITY CENTRE	INT. BB SUBMARINE CABLE	LIGHT RAIL	NORTH COAST CONNECT
P	**+1**	**+1**	**+1**	**+1**	**+1**	**+1**	**+1**
I1	(0.75 x 50)	(0.75 x 50)	(0.5 x 50)	(0.75 x 50)	(1.00 x 50)	(0.75 x 50)	(0.75 x 50)
I2	(1.00 x 25)	(1.00 x 25)	(1.00 x 25)	(1.00 x 25)	(0.50 x 25)	(1.00 x 25)	(1.00 x 25)
I3	(1.00 x 25)	(0.75 x 25)	(1.00 x 25)	NA	(0.50 x 25)	(0.50 x 25)	NA
Total	87.5	81.25	75	NA	75	75	NA
	High priority	High priority	Priority	NA	Priority	Priority	NA

5.3   Categorisation rubric summary

The regional priority categorisation rubric enables the categorisation of a suite of regional projects. The exercise was relatively direct and easy to apply; however, there were limitations. The assessment of 'prescribed or adopted intent to transform the region's economy' retains a level of subjectivity, even with narrated criteria. The other categories are easy to apply, but sourcing consistent project information remains problematic, and there are very few consistent approaches to reporting initial capital investment or sustained new employment.

6   CONCLUSIONS

The contribution of this research is first considered in terms of methodology, then the salient findings are discussed in regard to industry applications, and future research opportunities are identified.

6.1   Research contributions

This research endeavoured to demonstrate designing a categorisation system to better assess proposed game-changing projects on the Sunshine Coast, Australia. Fundamental to this goal is the principle that knowledge and understanding of a problem and its solution are acquired in the process of designing and building an artefact. As such, this research comprised the design and development of a categorisation rubric. The project utilised principles and activities of design science, a novel but accepted approach in the property discipline. Design science is soundly based on traditional experimental and design approaches to education, and an established method in Information Technology (Hevner et al. 2004). The design science method was supported by theories and practices from the project management and education disciples.

Table 6.1 outlines the salient expression of design science activities and how they were applied in this research project. Problem identification and research motivation were progressively refined throughout the duration of the research, and the objectives for the solution established in Section 2. As the problem evolved and solutions were considered, the research extended to the design and development of an evaluation framework. The framework was subsequently applied to a suite of projects, as described in Section 5.

Table 6.1: Design science research methodology (DSRM) activities

DSRM ACTIVITY	AS APPLIED IN THE DESIGN OF THE EVALUATION FRAMEWORK
Problem identification and [research] motivation	There is no shared definition for what constitutes a game-changing or priority regional project. The measures employed by the sponsors and respective authorities are project-centric and have two clear limitations. When applied in an environmental impact statement the measures are generally applied at a single point in time, looking at an isolated project rather than the influence the project has on the portfolio of regional projects, both underway and proposed. A second limitation is evident in the Sunshine Coast Airport expansion analysis where the modelling gives no explicit consideration to the impact of the project, or portfolio of projects, on existing property values.
Define the objectives for a solution	Primary objective: to enhance the assessment of regionally significant projects on the Sunshine Coast, Queensland, Australia.
Design and development	Design and develop a purpose-built evaluation framework to enable the categorisation, measurement and delivery of projects significant to the Sunshine Coast.
Demonstration	The purpose-built framework has been applied to categorise a suite of regional projects as high priority, priority and not a priority. The indicative investment cashflows project from the high priority and priority regional projects have been modelled in the evaluation framework.
Evaluation	Preliminary evaluation of the categorisation rubric has been undertaken in Section 5. Further evaluation of the full framework may be undertaken as a subsequent research endeavour.
Communication	This structured report, the industry presentations and conference publications provide the primary communication mechanisms, being explicitly structured to align with design science guidelines and activities.

6.2   Industry contributions

The findings of this research project support the notion that an evaluation framework enhances assessment of the financial and economic benefits of proposed game-changing or priority projects on the Sunshine Coast region in Queensland, Australia. Specifically, the project presents an evaluation framework with an assessment rubric ready to categorise industry initiates, projects and portfolios.

From here, applying the evaluation framework and undertaking further research may refine and enhance the process and product. In turn, this will provide additional support for embedding the framework in the decision-making process for regions outside the Sunshine Coast.

To enhance decision-making around regionally significant projects, the following recommendations have emerged from the research. Sponsors and stakeholders in regionally significant projects are encouraged to:

1. Use the presented evaluation framework to model potential regionally significant initiatives and projects. This may be enabled by establishing a working party and digital domain where this report and the evaluation frameworks are made publicly available.
2. Facilitate the delivery of identified priority projects and portfolios in a manner that realises the benefits of portfolio management and organisational program management. This may require establishing an independent and resourced management entity, or an expansion of the role of existing organisations such as the RDA.
3. Empirically evaluate, refine and share the findings from the evaluation framework application. The entity tasked with maintaining the evaluation framework should encourage the capture of lessons learned to guide the refinement of the framework. Ideally, this information would be made freely available to subsequent researchers to allow empirical assessment of the product and development process.
4. Adopt international project management terminology in developing guidelines and communicating project details. PMI (2017a) definitions for projects, programs and portfolios should be applied from project inception to finalisation. Project sponsors and local authorities should be discouraged from introducing persuasive or misleading jargon when communicating project attributes to stakeholders.
5. Choose the delivery model, structure and lifecycle best aligned to achieve set objectives. While traditional approaches to project management have the advantage of being understood by a set project team, they can be poorly suited to deliver on project objectives. For dynamic projects, a more dynamic approach to project and portfolio management may be warranted.
6. Set milestone re-evaluation and re-analysis dates for priority projects. The findings for re-assessments should be categorised and shared to guide future evaluations of projects with similar attributes.
7. Apply financial analysis through whole of government cash flow modelling. The analysis should extend beyond measuring the impact on the sponsoring agency or department. Specifically, land use impacts and the recapture of land-based taxes and rates should be analysed in further detail. This additional analysis will require further resourcing around forecasting and valuation of land.
8. Collaborate in the progression to a Master Assessment Framework and guideline document. Frameworks such as IA's Assessment Framework and QT's Project Assessment Framework provide a sound foundation for financial and economic analysis. While fundamentally similar, there are variations including those attributed to progressive updates.

9. Adopt theories and practices from organisational program management (PMI 2017a) and portfolio management. These approaches should be applied in designing a delivery model for any project of regional significance.
10. Mandate the consistent reporting of information for regional priority projects. Frameworks and guidelines should be extended to prescribed minimum acceptable reporting standards. For example, initial capital should be reported in both forecast and net present value terms. Sustained new employment should be clearly articulated and presented on a full-time equivalent basis.

6.3   Further research

The potential to enhance project decision-making through designing a project evaluation framework has emerged in this research. However, there remain numerous opportunities for future research to empirically confirm or refute the claim, and design new frameworks and artefacts for analysis. As this research extends, the limitations associated with this study will become less relevant. However, it is important to note that early-stage and quasi-industry projects such as this research endeavour are inherently subject to numerous limitations.

A defining and controversial aspect in qualitative research of this nature relates to the active role of the researcher and their potential to influence the results of the study. With the intention of mitigating the influence of bias and misrepresentation, a soundly based research approach, design science, is incorporated. Even so, the application of design science is not uniform, with the objectives-based approach of Peffers et al. (2008) applied in this research not universally accepted as design science methodology. Similarly, the parameters for evaluation in a design science method are not clearly defined.

The evaluation rubric is a novel addition by the author. While the rubric construction is informed by published research findings and project management investigations, the matrix lacks the empirical support and calibration associated with utilising an existing, tested model. While prototype testing sufficiently informs the design activity, empirical testing of the evaluation framework is recommended as a standalone research project.

6.4   Finalisation

This research has addressed an emerging issue—and opportunity—in project management. The study demonstrates the application of a body of knowledge to research, investigates and develops new knowledge, and advances that into the specific field of regional project decision-making. This cross-disciplinary research presents the artefact and journey for subsequent empirical testing.

The research presents a way to categorise, measure and deliver projects of significance to the Sunshine Coast region and realise the economic benefits or 'ripple effect'.

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APPENDIX A: CATEGORISATION RUBRIC

REGIONALLY SIGNIFICANCE CATEGORISATION RUBRIC
Project Alpha   30-Nov-18

KEY	CRITERIA	PORTFOLIO [+1]	PROJECT [+1]	PROCESS [-1]	MANAGEMENT [0]	ACTIVITY [0]
PROJECT (P)	**Nature** of initiative (P)	Projects, programs, subsidiary portfolios, and operations managed as a group to achieve strategic objectives	Temporary endeavour[s] undertaken to create a unique product, service or result	Systematic series of activities directed towards improving a product, service or result	Systematic series of activities directed towards maintaining a product, service or result	A distinct, scheduled portion of work performed during a project
IMPACT (I)	CRITERIA	HIGH PRIORITY [1.00]	PRIORITY (Fairly important) [0.75]	IMPORTANT [0.50]	SLIGHTLY IMPORTANT [0.25]	NOT AT ALL IMPORTANT [0.00]
	Prescribed or adopted **intent** to transform the region's economy (I1) [50]	Potential to transform the region's economy and its employment base, generating an array of associated investment opportunities	Potential to materially improve the region's economy and its employment base, generating associated investment opportunities	Potential to improve the region's economy and its employment base, generating associated investment opportunities	Potential to improve the region's economy and/or its employment base	No potential to materially improve the region's economy or its employment base
	Initial capital **investment** (I2) [25]	Estimated investment exceeds AU $250 million (1.61% of GRP1)	Estimated investment of AU $100 million (0.65% of GRP1) to AU $250	Estimated investment of AU $50 million (0.32% GRP1) to AU $100 million	Estimated investment of AU $10 million (0.06% GRP1) to AU $50 million	Estimated investment less than AU $10 million
	Sustained new **employment** (I3) [25]	Estimated ongoing FTE jobs exceeds 2000 (0.58% of EP2)	Estimated ongoing FTE jobs of 1000 (0.29% of EP2) to 2000	Estimated ongoing FTE jobs of 200 (0.06% of EP2) to 1000	Estimated ongoing FTE jobs of 20 (0.01% of EP2) to 200	Estimated ongoing FTE jobs less than 20
HURDLE		80	65	80	15	

INPUT	CRITERIA	1	1	-1	0	0
PROJECT (P)	**Nature** of initiative (P)	0	1	0	0	0
	CRITERIA	1	0.75	0.5	0.25	0
IMPACT (I)	50	0	0	1	0	0
	25	1	0	0	0	0
	25	0	0	0	1	0

ASSESSMENT		
NATURE	1	**PORTFOLIO / PROJECT**
I1	25	
I2	25	
I3	6.25	
TOTAL	56.25	**NOT A PRIORITY**

EXTRACT INDICATIVE ONLY
REFER TO THE FULL WORKING MODEL AND REPORT FOR FURTHER INFORMATION

APPENDIX B: FINANCIAL ANALYSIS

ENABLING PROJECTS OF REGIONAL SIGNIFICANCE

Evaluation framework

Project:	Project Alpha
Scenario:	Project Alpha Cost Benefit Analysis Scenario (January 2018)
Address:	Sunshine Coast, Queensland
Analyst:	Steven T Boyd
Contact:	sboyd@usc.edu.au
Date:	30-Nov-18
Notes:	

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EXTRACT INDICATIVE ONLY
REFER TO THE FULL WORKING MODEL AND REPORT FOR FURTHER INFORMATION

</div>

Assumptions

Cash flow rests:	Monthly
Discount rate:	7.00%
Discount rate (mth.):	0.57%

Model information

Designer:	Dr Steven T Boyd
Client:	Sunshine Coast Business Council
Created:	6-Oct-18
Updated:	6-Oct-18
Further information:	Boyd S 2018 Enabling projects of regional significance, …designing a framework to categorise, measure and deliver projects of significance to the Sunshine Coast region, Confidential report prepared for Sunshine Coast Business Council, November 2018.

INVESTMENT ANALYSIS DISCOUNTED CASH FLOW
Project Alpha

DCF	DATE	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20
	MONTH	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
	INDEX CPI	1.00	1.00	1.00	1.01	1.01	1.01	1.01	1.01	1.02	1.02	1.02	1.02	1.03	1.03	1.03	1.03	1.03	1.04	1.04	1.04	1.04	1.04	1.05	1.05
	INDEX CAPITAL	1.00	1.00	1.00	1.01	1.01	1.01	1.01	1.02	1.02	1.02	1.02	1.03	1.03	1.03	1.04	1.04	1.04	1.04	1.05	1.05	1.05	1.05	1.06	1.06
	INDEX OPERATING	1.00	1.00	1.00	1.01	1.01	1.01	1.01	1.02	1.02	1.02	1.02	1.03	1.03	1.03	1.03	1.03	1.04	1.04	1.04	1.04	1.05	1.05	1.05	1.05
	INDEX DEMAND	1.00	1.00	1.01	1.01	1.01	1.01	1.02	1.02	1.02	1.03	1.03	1.03	1.04	1.04	1.04	1.04	1.05	1.05	1.05	1.06	1.06	1.06	1.07	1.07
CP1.1	Purchase costs	-	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CP1.2	...	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CC1.2	Capital costs	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CC1.3	...	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO1.1	Operating costs	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C	Total costs	-	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IR1.1	Income	-	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IR1.2	...	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IS1.1	Terminal value	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
I	Total income	-	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NC1.0	Net cash flow	-	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

RESULTS

Net present value (NPV)	-	0
Internal rate of return (IRR)		0.00%
Benefit cost ratio:		0.99
NPV (Costs)	-	0
NPV (Income)		0

EXTRACT INDICATIVE ONLY
REFER TO THE FULL WORKING MODEL AND REPORT FOR FURTHER
INFORMATION

APPENDIX C: ECONOMIC ANALYSIS

ECONOMIC ANALYSIS DISCOUNTED CASH FLOW
Project Alpha

DCF	DATE	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20
	MONTH	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CP1.1	Purchase costs	-1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CP1.2	...	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CC1.2	Capital costs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CC1.3	...	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CO1.1	Operating costs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C	**Total costs**	-1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
BR1.1	Incremental benefit	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
BR1.2	Incremental benefit	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
BS1.1	Residual value	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
I	**Total benefits**	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NC1.0	Net cash flow	-1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

RESULTS

Net present value (NPV)	-	0
Internal rate of return (IRR)		0.00%
Benefit cost ratio:		0.00
NPV (Costs)	-	1
NPV (Benefits)		0

APPENDIX D: INITIAL PORTFOLIO ANALYSIS

PRIORITY PORTFOLIO DISCOUNTED CASH FLOW
Quarterly projection of investment in Priority and High Priority Regional Projects on the Sunshine Coast

EXTRACT INDICATIVE ONLY — REFER TO THE FULL WORKING MODEL AND REPORT FOR FURTHER INFORMATION

PROJECT	STAGE	2018 Q3	2018 Q4	2019 Q1	2019 Q2	2019 Q3	2019 Q4	2020 Q1	2020 Q2	2020 Q3	2020 Q4	2021 Q1	2021 Q2	2021 Q3	2021 Q4	2022 Q1	2022 Q2	2022 Q3	2022 Q4	2023 Q1	2023 Q2	2023 Q3	2023 Q4	2024 Q1	2024 Q2	2024 Q3	2024 Q4
North Coast Connect (I)	I																										
North Coast Connect (P	P	1,053,889	1,053,889	1,053,889	1,053,889	1,053,889	1,053,889	1,053,889	1,053,889	1,053,889																	
North Coast Connect (E-	E-1A											53,571,429	53,571,429	53,571,429	53,571,429	53,571,429	53,571,429	53,571,429	53,571,429	53,571,429	53,571,429	53,571,429	53,571,429	53,571,429	53,571,429	53,571,429	53,571,429
North Coast Connect (E-	E-1B											106,250,000	106,250,000	106,250,000	106,250,000	106,250,000	106,250,000	106,250,000	106,250,000								
North Coast Connect (E-	E-2																										
North Coast Connect (F)	F																										
Aura (E-1EST)	E-1EST	79,651,786	79,651,786	79,651,786	79,651,786	79,651,786	79,651,786	79,651,786	79,651,786	79,651,786	79,651,786	79,651,786	79,651,786	79,651,786	79,651,786												
Aura (E-2ESC)	E-2ESC															138,531,250	138,531,250	138,531,250	138,531,250	138,531,250	138,531,250	138,531,250	138,531,250	138,531,250	138,531,250	138,531,250	138,531,250
Aura (E-1EVO)	E-1EVO																										
Airport		28,916,667	28,916,667	28,916,667	28,916,667	28,916,667	28,916,667	28,916,667	28,916,667	28,916,667	28,916,667																
Maroochydore City Centre		47,133,333	47,133,333	47,133,333	47,133,333	47,133,333	47,133,333	47,133,333	47,133,333	47,133,333	47,133,333	47,133,333	47,133,333	47,133,333	47,133,333	47,133,333	47,133,333	47,133,333	47,133,333	47,133,333	47,133,333	47,133,333	47,133,333	47,133,333	47,133,333	47,133,333	47,133,333
Int. BB Submarine Cable		7,437,500	7,437,500	7,437,500	7,437,500	7,437,500	7,437,500	7,437,500	7,437,500																		
Health Precinct		5,625,000	5,625,000	5,625,000	5,625,000	5,625,000	5,625,000	5,625,000	5,625,000	5,625,000	5,625,000	5,625,000	5,625,000	5,625,000	5,625,000	5,625,000	5,625,000	5,625,000	5,625,000	5,625,000	5,625,000	5,625,000	5,625,000	5,625,000	5,625,000	5,625,000	5,625,000
Light rail										57,500,000	57,500,000	57,500,000	57,500,000	57,500,000	57,500,000	57,500,000	57,500,000	57,500,000	57,500,000	57,500,000	57,500,000	57,500,000	57,500,000	57,500,000	57,500,000	57,500,000	57,500,000
Cash flow		169,818,175	169,818,175	169,818,175	169,818,175	169,818,175	169,818,175	169,818,175	169,818,175	219,880,675	218,826,786	349,731,548	349,731,548	349,731,548	349,731,548	408,611,012	408,611,012	408,611,012	408,611,012	302,361,012	302,361,012	302,361,012	302,361,012	302,361,012	302,361,012	302,361,012	302,361,012

ANALYSIS

Present value (PV)	9,557,990,423

EXTRACT INDICATIVE ONLY
REFER TO THE FULL WORKING MODEL AND REPORT FOR FURTHER INFORMATION

Legend:
- NORTH COAST CONNECT (I)
- NORTH COAST CONNECT (P)
- NORTH COAST CONNECT (E-1A)
- NORTH COAST CONNECT (E-1B)
- NORTH COAST CONNECT (E-2)
- NORTH COAST CONNECT (F)
- AURA (E-1EST)
- AURA (E-2ESC)
- AURA (E-1EVO)
- AIRPORT
- MAROOCHYDORE CITY CENTRE
- INT. BB SUBMARINE CABLE
- HEALTH PRECINCT
- LIGHT RAIL